

Convention on the Conservation of Migratory Species of Wild Animals

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MAPPING TRANSBOUNDARY HOTSPOTS FOR THE CENTRAL ASIAN MAMMALS INITIATIVE

(Draft report prepared by Stefan Michel)

Mapping Transboundary Conservation Hotspots for the Central Asian Mammals
Initiative

Report – Draft 2 for CAMI Range States Representatives and Species Focal Points, revised
based on comments by the CMS Secretariat and

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Abbreviations

AoI	-	Area of Interest
AOO	-	Area of Occupancy
CAMI	-	Central Asian Mammals Initiative
CITES	-	Convention on International Trade in Endangered Species
CMS	-	Convention on the Conservation of Migratory Species of Wild Animals
EOO	-	Extent of Occurrence
IUCN	-	International Union for the Conservation of Nature
MME	-	Mass Mortality Event(s)
MSF	-	Michael Succow Foundation (Germany)
NABU	-	Nature and Biodiversity Conservation Union (Germany)
NP	-	National Park
PoW	-	Program of Work
PPR	-	Peste des Petits Ruminants (sheep and goat plague)
SPA	-	Strictly Protected Area (<i>zapovednik</i>)
SSC	-	Species Survival Commission of the IUCN
TA(s)	-	Transboundary area(s)
WCS	-	Wildlife Conservation Society (USA)
WWF	-	Worldwide Fund for Nature

Abbreviations for Range States:

AFG	-	Afghanistan
CHN	-	China, Peoples Republic of
IRN	-	Iran, Islamic Republic of
KAZ	-	Kazakhstan, Republic of
KGZ	-	Kyrgyz Republic
MNG	-	Mongolia
RUS	-	Russian Federation
TJK	-	Tajikistan, Republic of
TKM	-	Turkmenistan
UZB	-	Uzbekistan, Republic of

Abbreviations for Species:

ACJU	-	Asiatic cheetah <i>Acinonyx jubatus venaticus</i>
CAFE	-	Wild camel <i>Camelus ferus</i>
CEHA	-	Bukhara deer <i>Cervus hanglu bactrianus</i>
EQFE	-	Przewalski's horse <i>Equus ferus przewalskii</i>
EQHE	-	Asiatic wild ass <i>Equus hemionus</i>
GABE	-	Chinkara <i>Gazella bennettii</i>
GASU	-	Goitered gazelle <i>Gazella subgutturosa</i>
OVAM	-	Argali sheep <i>Ovis ammon</i>
OVVI	-	Urial sheep <i>Ovis vignei</i>
PAPA	-	Persian leopard <i>Panthera pardus saxicolor</i>
PAUN	-	Snow leopard <i>Panthera uncia</i>
PRGU	-	Mongolian gazelle <i>Procapra gutturosa</i>
SATA	-	Saiga antelope <i>Saiga tatarica</i> (incl. <i>S. borealis</i>)

1. Background

The Central Asian Mammals Initiative (CAMI) is implemented under the Convention on the Conservation of Migratory Species of Wild Animals (CMS). CAMI aims at the conservation of 15 migratory large mammal species in the wider Central Asian region throughout their range covering 14 countries.

At the Midterm Review Meeting of CAMI, held on April 16-19, 2018, on Vilm Island, Germany, participants recommended to focus on the promotion of transboundary conservation as a main priority within CAMI until 2020. It was recommended to identify and analyse trans-boundary conservation hotspots of major importance to CAMI species in the region and develop recommendations for their conservation, building on existing projects and information available within CAMI. In addition, CMS Resolution 12.7 on the role of ecological networks for the conservation of migratory species also reinforces the commitment of CMS Parties to protect trans-boundary habitats.

In line with these recommendations and with funding from the Government of Switzerland the Secretariat has commissioned the present study aiming at i) identifying key trans-boundary conservation areas in the CAMI region, ii) developing recommendations for progressing transboundary cooperation and effective conservation of those areas and their wildlife populations and iii) preparing information on those areas and populations to guide decision-makers in strengthening trans-boundary cooperation.

This study builds on the Central Asian Mammals Migration and Linear Infrastructure Atlas (further CAMI Atlas), prepared under CAMI by WCS and finalized in 2019. This Altlas compiles information on distribution of and threats resulting from linear infrastructure to populations of CAMI species. The Atlas covers the following Range States: Afghanistan, Iran, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, Turkmenistan and Uzbekistan and adjacent range areas of target species in the Peoples Republic of China and the Russian Federation.

The Area of Interest (AoI) of this study is therefore identical with the area covered by the CAMI Atlas as it also builds on the maps developed in the frame of that project. To some extent, additional border areas of the People's Republic of China that are part of the range of at least one target species were also considered.

This study also covers the same species as the CAMI Atlas:
Asiatic cheetah, wild camel, Bukhara deer, Asiatic wild ass, chinkara, goitered gazelle, argali sheep, Mongolian gazelle, saiga antelope and snow leopard.

This study also includes Przewalski's horse, which is listed in CMS Appendix I and included in CAMI but was not covered in the CAMI Atlas.

Two additional species have also been taken into consideration for this study since they share the same habitat and are an important part of the respective ecosystem, namely the Persian leopard (listed on CMS Appendix II) and the urial sheep (currently not listed under CMS). However, since those species are not formally covered by CAMI, they are not being considered for the prioritization of the identified areas in Chapter 5.

Whether and in how far the presence of those species should be taken into account in assessing the importance of the respective areas and in developing conservation strategies for them is subject for discussion at the CAMI Range States Meeting in Mongolia from 25-28 September 2019 (see also below).

Table 1 at page 10 provides an overview of the species covered in this study.

In this assessment the focus is on populations or subpopulations of transboundary character within the geographic scope of this assessment.

2. Working approach and methods

The consultant followed the approach and steps outlined in the Terms for Reference:

- 1) Key trans-boundary populations and the associated transboundary areas (TAs) were identified by:
 - a. Using the CAMI Atlas and other available literature and data on species distribution to identify Range States of the species and transboundary populations of these species;
 - b. Using available literature and data on species distribution to prepare a long-list of potentially relevant TAs and its target species;
 - c. In close consultation with the CMS Secretariat, liaising with the CAMI Species Focal Points and CMS National Focal Points in the region, relevant IUCN Specialist Groups, experts and NGOs to obtain additional information on the potential TAs, species distribution and movements, important transboundary populations and areas, barriers to migration and other threats and past, ongoing, planned and desirable conservation action in the TAs;
 - d. Compiling a list of the transboundary populations of each species and the associated transboundary areas;
 - e. Identifying and analyzing TA-specific threats to these populations and respective conservation needs;
 - f. Analysing and listing current and existing work and initiatives that are already ongoing and/or planned to enhance the conservation of species in those TAs as well as main decision-making bodies and stakeholders in respective countries.
- 2) An initial prioritization and selection of TAs according to conservation importance and feasibility was undertaken by:
 - a. Assessing the importance of each area for the respective species,
 - b. Assessing the need, urgency and feasibility for implementing conservation action in each TA;
 - c. Considering the requirements for implementation of CMS instruments and mandates (CAMI Programme of Work, Resolutions and Decisions), as well as other existing agreements and trans-boundary projects;
 - d. In cooperation with the CMS Secretariat, liaising with the National Focal Points in the range states for information on existing efforts to strengthen transboundary conservation and inquire about their interest, and the overall feasibility to enhance cooperation in those areas.
- 3) The feasibility of implementing effective transboundary cooperation to enhance conservation of those transboundary populations and areas was assessed.
- 4) A set of key recommendations for promoting cooperation and transboundary conservation of the most important TAs in the context of CMS and CAMI was developed.

The findings of this study as presented in this draft report will be discussed by representatives of the Range States, the Species Focal Points and other experts at the Second Range State Meeting of CAMI on 25-28 September in Mongolia.

The discussions should in particular provide input and guidance with regard to the prioritization of important TAs, the assessment of feasibility of implementing transboundary cooperation in those areas as well as the finalization of key recommendations.

The basis for the maps of the range areas of the species are those of the CAMI Atlas and The IUCN Red List. The areas were further specified and modified based on own expertise and information from various experts, where sufficient information was available.

The spatial information gathered in the process was provided to the CMS Secretariat in form of GIS files in appropriate format to be further processed to create accurate maps of the selected TAs.

3. Characteristics of the species

3.1 General remarks

The species listed in Table 1 are considered in this assessment. This section briefly characterizes the status of these species, their Range States and ranges as well as the significance of transboundary movements and migrations for their conservation.

The scientific names used in this report are those applied by the respective IUCN SSC Specialist Groups in The IUCN Red List. These names in few cases differ from Wilson and Reeder (2005), which is the standard taxonomic reference adopted by CMS Parties. In those cases the scientific name as listed on the CMS Appendices is provided in Table 1.

The CMS standard taxonomic reference (Wilson and Reeder, 2005) applies in some cases the names of domestic animals to their wild ancestors and even to other related taxa, which are not the ancestors of the respective domestic species. This is not in line with the respective ruling by the International Commission on Zoological Nomenclature (ICZN 2003; Gentry et al., 2004). Among the species covered in this study this concerns wild camel, Przewalski's horse and urial sheep. Wilson and Reeder (2005) named the wild camel *Camelus bactrianus* (the name of the domestic camel), while *Camelus ferus* should be the correct name. Wilson and Reeder (2005) included the urial sheep *Ovis vignei* in *Ovis aries* (the name of the domestic sheep). In the case of Przewalski's horse, the CMS as an exemption applies the name *Equus ferus przewalskii* instead of following Wilson and Reeder (2005) who used *E. caballus* for both the wild and domestic forms of horse.

The naming of Bukhara deer in this study follows The IUCN Red List, which treats *Cervus hanglu* as species separate from *Cervus elaphus*, and Bukhara deer as subspecies *bactrianus* of this species.

Ovis vignei is applied here for the urial as separate species instead of *Ovis orientalis*, which combines two species – mouflon and urial *Ovis gmelini*, as recommended by the IUCN SSC Caprinae Specialist Group and accepted by IUCN for the reassessment of both species under The IUCN Red List.

In this study the snow leopard is named *Panthera uncia* as in The IUCN Red List.

Saiga tatarica is treated here as one species consisting of two subspecies *S.t.tatarica* and *S.t.mongolica*, instead of considering the latter a separate species *S. borealis*.

Table 1: Overview of the species covered by this assessment

Common species name	Scientific name	Different scientific name applied by CMS	CMS Appendix	Species abbreviation
Species included in CAMI				
Asiatic cheetah	<i>Acinonyx jubatus venaticus</i>		I	ACJU
Wild camel	<i>Camelus ferus</i>	<i>Camelus bactrianus</i>	I	CAFE
Bukhara deer	<i>Cervus hanglu</i>	<i>Cervus elaphus bactrianus</i>	I	CEHA
Asiatic wild ass	<i>Equus hemionus</i>		II	EQHE
Chinkara	<i>Gazella bennettii</i>			GABE
Goitered gazelle	<i>Gazella subgutturosa</i>		II	GASU
Argali sheep	<i>Ovis ammon</i>		II	OVAM
Mongolian gazelle	<i>Procapra gutturosa</i>		II	PRGU

Saiga antelope	<i>Saiga tatarica</i>	<i>Saiga tatarica</i> and <i>S. borealis</i>	II	SATA
Snow leopard	<i>Panthera uncia</i>	<i>Uncia uncia</i>	I	PAUN
Przewalski's horse or takhi	<i>Equus ferus przewalskii</i>		I	EQFE
Other mammal species considered in this study				
Persian leopard	<i>Panthera pardus saxicolor</i>		II	PAPA
Urial sheep	<i>Ovis vignei</i>	<i>Ovis aries</i> (Wilson & Reeder 2005)	-	OVVI

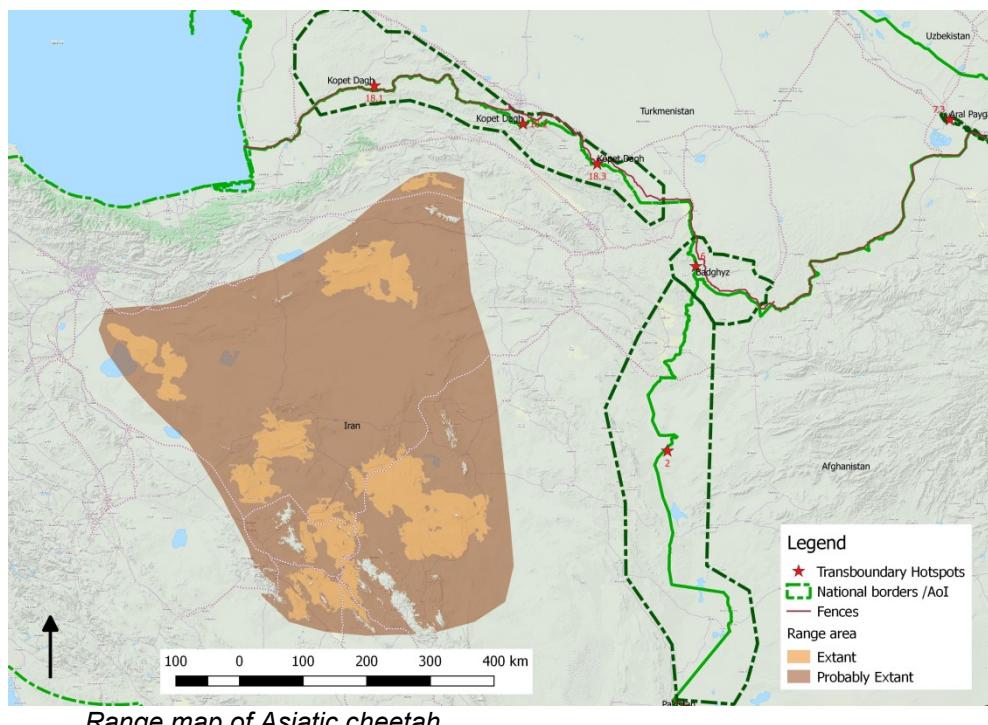
3.2 Asiatic cheetah *Acinonyx jubatus venaticus*

Status

Asiatic cheetah is assessed as critically endangered (CR) subspecies in The IUCN Red List¹. The global population might be now below 50 individuals and the number of confirmed reproducing females is likely below ten. The human induced mortality, mainly road kills and deliberate killings, in combination with indirect factors, like the reduction of prey species by poaching and habitat degradation is the largest threat to the survival of the Asiatic cheetah.

Range areas

The Asiatic cheetah is now restricted to few areas in Central and Northern Iran. Given the low numbers, the mapped extent of occurrence and area of occupation are probably much larger than the habitat actually used.



Range States

- Iran (extant);

¹ <https://www.iucnredlist.org/species/220/13035342>

- Afghanistan and Turkmenistan (likely extinct), Kazakhstan, India, Pakistan, Tajikistan and Uzbekistan (extinct)

Conservation significance of transboundary populations, migrations and movements

Research on Iranian cheetahs has shown that cheetahs make long-distance movements up to more than 200 km². So, there might be very limited chances of occasional incursions into Afghanistan and Turkmenistan. However, no confirmed records are documented in these countries for several decades.

The Asiatic cheetah persisted in Turkmenistan until the late 1970s. There are some unconfirmed reports from the 1980s and even in the 1990s for the Ustyurt Plateau in the north of the country.³ Rosen (2017) in a National Geographic blog⁴ described her encounter with a Turkmen, who told her about a cheetah he allegedly had spotted in the west of the Kopet Dagh Mountains in 2015. Cheetahs occur in Miandasht Wildlife Refuge in north-eastern Iran near the border with Turkmenistan, some 150 km from the Turkmen border. Similarly the PWHF team documented a group of cheetah in Touran Biosphere Reserve, west of Miandasht. One cheetah was also spotted in Golestan National Park after 40 years.

In Afghanistan cheetah is considered extinct since the 1950s, but a skin offered in 2006 in Mazar-e Sharif and allegedly originating from the province of Samangan may indicate the occurrence of the species in remote areas in Afghanistan (Manati and Nogge 2008).

Although the chances are extremely low that reproducing subpopulations establish from these possible transboundary movements, attention is warranted. First, the precarious status of Asiatic cheetah makes the survival of any single individual extremely important and second, in the case of an overall recovery of the cheetah numbers such long distance migrations might in the future provide the chance for the recolonization of parts of the former range area.

Potential areas for transboundary conservation include the western edges of the Kopet Dagh between Iran and Turkmenistan and the border regions between Iran and Afghanistan.

Proposed TA of significance for the species

ID No.	2	Working Name	
Countries	Afghanistan, Iran		
Geographic location	Entire border area		
Coordinates	N 33.320370°, E 60.789269°		

ID No.	18	Working Name	Kopet Dagh
Countries	Iran, Turkmenistan		
Geographic location	Entire mountain range		
Coordinates	N 38.138427°, E 56.020189°; N 37.649680°, E 58.440410°; N 37.131702°, E 59.647731°		

² <http://www.wildlife.ir/en/2018/10/06/another-long-distance-movement-by-an-asiatic-cheetah-recorded-in-central-iran/>

³ http://www.catsg.org/cheetah/04_country-information/Asia/turkmenistan.htm

⁴ <https://blog.nationalgeographic.org/2017/07/09/searching-for-the-last-asiatic-cheetah-on-a-golden-horse/>

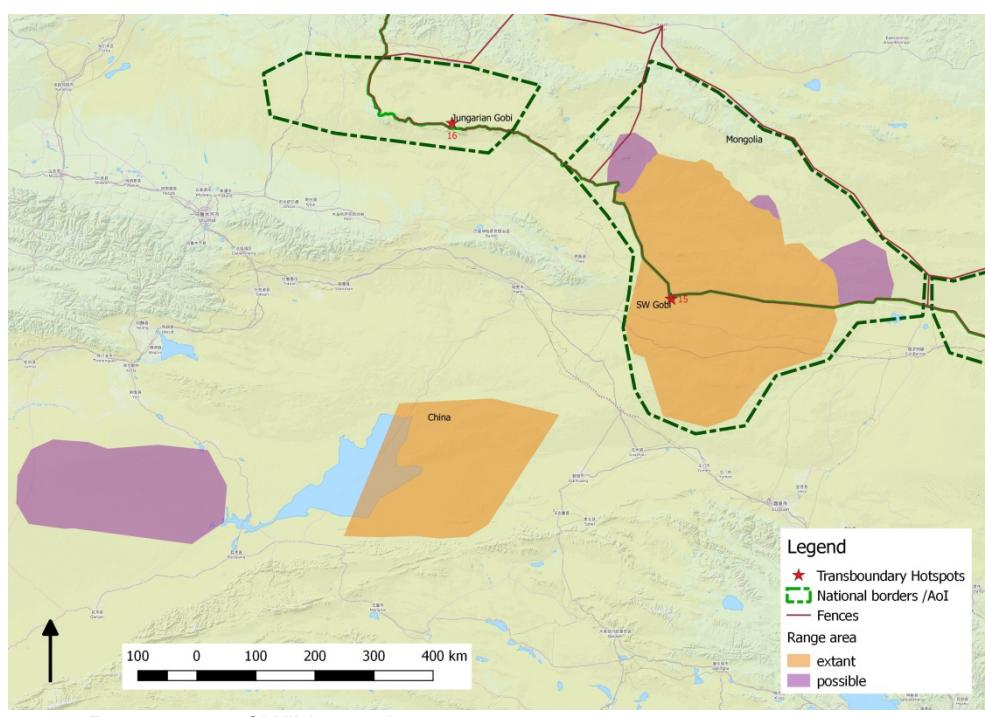
3.3 Wild camel *Camelus ferus*

Status

The wild camel is assessed as CR in The IUCN Red List by Hare (2008)⁵, stating that in the year 2004, there were approximately 600 individuals surviving in China and 350 in Mongolia. There is general consensus that wild camel populations are declining or are at best stable, primarily because recruitment appears low (Kaczensky, 2014). Causes of decline likely include legal and illegal mining, poaching, loss of water sources, hybridization with domestic camel as well as negative influences of local pastoralists and their livestock (Adiya, 2019⁶).

Range areas

Wild camels are surviving in three small, disjunctive populations in China and Mongolia. The maps provided by Hare (2008) in The IUCN Red List and by the CAMI Atlas are not fully consistent. The species' distribution in Mongolia is reported to have shrunken by 70% since the last century, and possibly as early as the 1940s, and became restricted to the area of today's Great Gobi A Strictly Protected Area (SPA) in the Transaltai Gobi by the 1970s (Kaczensky et al., 2014). There are three groups in China, namely a small area of the Taklamakan Desert, the Gashun Gobi in the north of Lop Nur and Arjin Mountain (Adiya et al., 2012).



Range map of Wild camel

⁵ <https://www.iucnredlist.org/species/63543/12689285>

⁶ <https://www.researchgate.net/project/Wild-Camel-Conservation-in-Central-Asia>

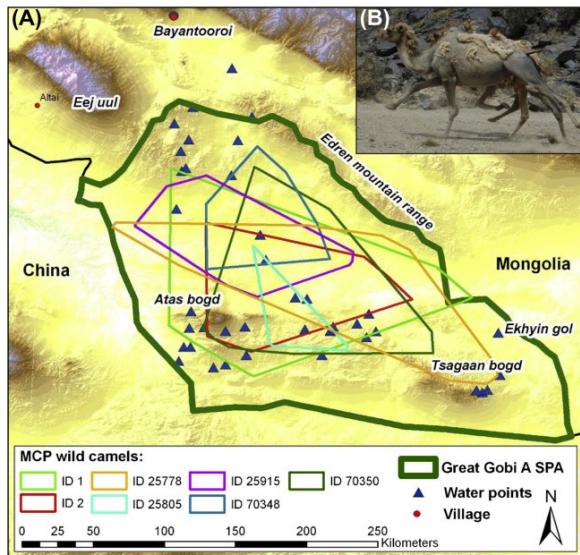


Fig. 1. (A) Home ranges, expressed as 100% minimum convex polygons (MCPs), of seven wild camels monitored 2002–2007 in the Great Gobi A SPA in southern Mongolia. (B) Two wild camels running from disturbance by research jeep.

Movements of collared camels in Great Gobi A SPA. Source: Kaczensky et al., 2014

Range States

- China, Mongolia (extant);

Conservation significance of transboundary populations, migrations and movements

The range area of wild camel in the Great Gobi A SPA in southern Mongolia reaches into China, making this population potentially transboundary. Wild camels have been recorded crossing the border in winter (Guoying et al., 2002) to reach Dacoatan Spring in China's Gansu Province, which lies 80 km south of the Atas Mountain Range in the Great Gobi A SPA in Mongolia and 15 km from the border. Chinese authorities lifted a ban on mining in this area in 1990 and mining poses a considerable threat to the wild camels that use this spring, because miners use potassium cyanide to extract gold, thereby contaminating large grazing areas (Adiya et al., 2012). Telemetry by Kaczensky et al. (2014) did not show transboundary movements of wild camel in this area.

This highly endangered animal nowadays faces the disadvantaged situation of being dispersed in at least three isolated populations with a still unidentified number of individuals. Adiya et al. (2012) recommended establishing a trans-boundary park between China and Mongolia and creating corridors for wild camels to move between isolated habitats within Mongolia.

Proposed TA of significance for the species

ID No.	15	Working Name	South-western Gobi
Countries	China, Mongolia		
Geographic location	Mongolian Trans-Altai Gobi desert, largely identical with Great Gobi A SPA.		
Coordinates	N 42.683870°, E 96.422978°		

3.4 Bukhara deer *Cervus hanglu bactrianus*

Bukhara deer is listed in Appendix I of CMS as “*Cervus elaphus yarkandensis* (populations in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and Afghanistan)” in line with Wilson and Reeder (2005). Molecular data suggested the Tarim Red Deer from Central Asia should be recognized as species separate from *Cervus elaphus*, including the populations from the Yarkand-Tarim and Bukhara regions and Indian Kashmir, which were formerly considered as subspecies of *C. elaphus*. The Tarim Red Deer should be recognized as *Cervus hanglu* Wagner, 1844 (with the provisional subspecies *C. h. yarkandensis*, *C. h. bactrianus* and *C. h. hanglu*, respectively). (Brooks et al., 2017).

Status

Brooks et al., 2017 for the first time assessed *Cervus hanglu* as separate species in The IUCN Red List assessed. The entire species was assessed as Least Concern (LC), justified by an increasing population of 2,000 – 2,500 mature individuals, extent of occurrence (EOO) of >1,000,000 km² and area of occupancy (AOO) not known, but not likely to approach the threshold of <2,000 km² to qualify for Vulnerable. (Brooks et al., 2017)

Given that the total population and AOO of *Cervus hanglu* are close to the thresholds for EN and VU, the species would better be assigned the category NT. Also the subspecies Bukhara deer *C.h.bactrianus* seems to qualify for the category NT, while *C. h. yarkandensis* and *C. h. hanglu* might be EN or CR, respectively.

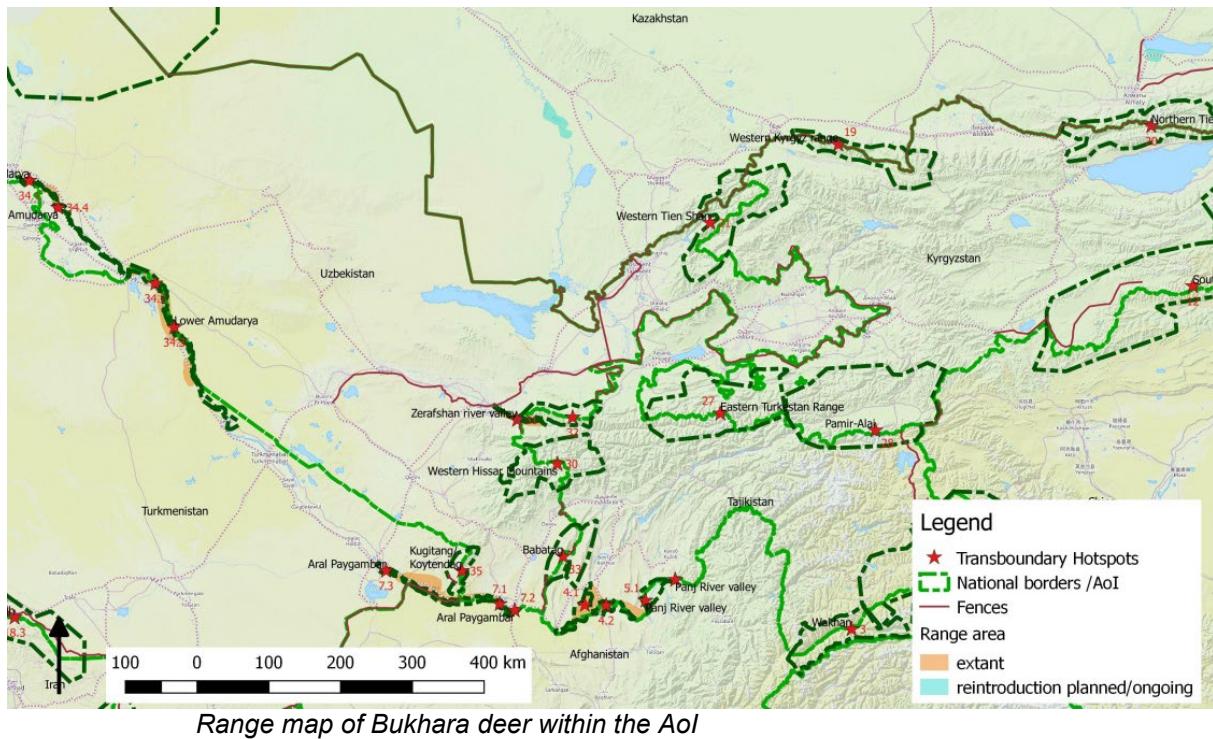
Range areas

The Bukhara deer occurs in eight distinct areas along the Amu-Darya and Panj rivers in the Range States Afghanistan, Tajikistan, Turkmenistan and Uzbekistan. In most areas (except Tigrovaya Balka in Tajikistan and Baday Tugay in Uzbekistan) the Bukhara deer populations were established by reintroduction efforts since the 1970s. Between some of these areas limited exchange might occur, in particular of males searching for mates. Another, entirely isolated range area is located in the Zerafshan River valley in Tajikistan and Uzbekistan. This population originated from (re-)introductions during the 1980s and 2000s. A free-ranging and self-sustaining population is established.

Thanks to reintroductions Kazakhstan again can qualify as range area of the species. The areas indicated in the CAMI Atlas and in The IUCN Red List (Brooks et al., 2017) are certainly larger than the areas occupied by the species in the country. These populations are not transboundary.

In the privately owned Karachingil Game Management Area at the Ili River Bukhara deer have been introduced in a large fenced area since 1981. This population currently consists of about 700 animals in a 10,000 ha enclosure. There is contradictory information if there is a free-ranging population (Levitin, pers. comm. 2019). The National Report for CMS (2011a) suggests that in 2011 there had been 40 free-ranging Bukhara deer, which had escaped from the fenced area during different years, but as far is known they have not formed a sustainable population. According to Levitin (pers. comm. 2019) once about 30 deer had escaped from the enclosure and were repeatedly observed in the hunting grounds “Manul”, but after about one year disappeared. Currently it is unlikely that a free-ranging population exists in Almaty Province.

In the region of Turkestan in the Syrdarya River valley currently about 75 Bukhara deer are kept in an enclosure for the purpose of future reintroduction. There are currently already about 100 free-ranging Bukhara deer. They seem to expand their range area and deer have been observed at up to 140 km distance from the enclosure. (Levitin, pers. comm. 2019)



Range States

- Afghanistan, Tajikistan, Turkmenistan, Uzbekistan (extant);
- Kazakhstan (fenced populations only(?), reintroduction planned);

Conservation significance of transboundary populations, migrations and movements

Except one area, Baday-Tugay with the currently probably largest population size, all populations at the Amu Darya, Panj and Zerafshan Rivers occur in areas shared between two or three range states or at least located immediately at international borders. At least some individuals, but likely also larger groups of Bukhara deer regularly cross these international borders. The main habitat of the deer, the riparian forests and associated bushes and reeds (so called *tugay*), during the last at least five decades became heavily fragmented and remnants of *tugay* are typically very small and in many locations only transboundary areas provide sufficient habitat for groups of deer to survive. Furthermore, the Amu Darya and Panj rivers over large sections form the international boundaries and at the same time act as corridors for movements and connection between the populations. Therefore, transboundary populations, migrations and movements are of essential importance for the conservation of Bukhara deer.

Proposed TA of significance for the species

ID No.	4	Working Name	Panj River valley-Tigrovaya Balka
Countries	Afghanistan, Tajikistan		
Geographic location	Area between the Vaksh and Panj Rivers, including Tigrovaya Balka SPA		
Coordinates	N 37.286642°, E 68.450740°; N 37.279697°, E 68.780875°		

ID No.	5	Working Name	Panj River valley
Countries	Afghanistan, Tajikistan		

Geographic location	Panj River valley in the districts Yangi Qaleh (AFG), Farkhor, Hamadoni and Shamsidin Shohin (TJK)
Coordinates	N 37.338443°, E 69.388120°; N 37.593436°, E 69.846198°

ID No.	7	Working Name	Aral Paygamar
Countries	Afghanistan, Uzbekistan		
Geographic location	Riparian areas near Termez, incl. former Aral Paygamar SPA, closed in the 1990s and upstream of "friendship" bridge		
Coordinates	N 37.297403°, E 67.137200°; N 37.219264°, E 67.368819°		

ID No.	31	Working Name	Zerafshan river valley
Countries	Tajikistan, Uzbekistan		
Geographic location	Zarafshon Reserve and Zarafshon NP		
Coordinates	N 39.520217°, E 67.404043°		

ID No.	34	Working Name	Lower Amudarya
Countries	Turkmenistan, Uzbekistan		
Geographic location	Amudarya s of "Kungrad"/Imeni Telmana; incl. Nazarkhan core zone (Uzbekistan) Amudarya near Lebap between Khorezm and Kyzylkum SPA, Amudarya SPA and Kyzylkum SPA		
Coordinates	N 42.307920°, E 42.307920°; N 41.124536°, E 61.821193°; N 40.612679°, E 62.112579°		

3.5 Przewalski's horse or Takhi *Equus ferus*

The Przewalski's horse or takhi is not covered in the CAMI Atlas as it is not yet included into CAMI. The species was listed in Appendix I of the CMS only after launching of CAMI.

Status

The takhi horse is currently assessed as endangered (EN) by King et al. (2014) in The IUCN Red List⁷, after having been extinct in the wild (EW) until 2008. At the End of 2012 there had been 178 mature individuals in the wild, all descendants from reintroductions.

Range areas

According to The IUCN Red List there are currently five locations where Przewalski's horses exist in their native range area. In Mongolia they occur in three locations: in Hustai NP, in Great Gobi B SPA, and in Khomiin Tal. In China since 2001 horses have been released into the Kalamaili Nature Reserve. The Gansu Endangered Species Research Center (GESRC) has released at least seven horses into the Dunhuang Xihu National Nature Reserve in 2010 and 2012. (King et al., 2015)

Range States

- China, Mongolia (extant and reintroduced);
- Kazakhstan; Russian Federation; Ukraine (extinct)

Conservation significance of transboundary populations, migrations and movements

So far none of the reintroduced populations is transboundary. The still small population in Mongolia's Great Gobi B SPA inhabits an area close to the border with China's Xinyang province, but the border region in the immediate range area is mountainous and might not be suitable for transboundary movements of the horses.

The locations of Kalamaili Nature Reserve and Dunhuang Xihu National Nature Reserve in China could not be identified, but their administrations seem to be in towns rather far from the border with Mongolia and its Great Gobi B SPA.

So currently transboundary populations, migrations and movements do not exist and their future conservation significance is not yet clear.

Proposed TA of significance for the species

ID No.	16	Working Name	Jungarian Gobi
Countries	China, Mongolia		
Geographic location	Great Gobi B SPA; Khovd-Xinjiang		
Coordinates	N 45.087319°, E 92.261473°		

⁷ <https://www.iucnredlist.org/species/7961/97205530>

3.6 Asiatic wild ass *Equus hemionus*

Status

The Asiatic wild ass is assessed as Near Threatened (NT) by Kaczensky et al. (2015a) in The IUCN Red List. This status represents an improvement compared to the classification as Endangered (EN) by Moehlman et al. (2008). The population data supporting the NT listing suggest that the change of category does not represent a genuine improvement, but rather new data indicate a larger than previously assumed population size. Kaczensky et al., projected a population decline of at least 20% over the next three generations, based on old prevailing and newly emerging risks.

The global estimate of population size and trends is primarily driven by the Mongolian population, which makes up more than 75% of the total. The Mongolian subspecies *E.h. hemionus* was specifically assessed by Kaczensky et al. (2015b) as NT. Its population reportedly is large (estimated 23,000 mature individuals) and currently appears stable, but there are a number of old (competition with livestock for water and pasture, poaching) and newly emerging threats (mainly infrastructure development and resulting barriers to migration, influx of people in the habitat causing an increasing pressure from livestock and poaching).

The so called Turkmen wild ass or kulan *E.h. ssp. kulan* has the status EN (Kaczensky et al., 2016). Its number was estimated with around 2,000 mature individuals and the population trend was considered as unknown. The last autochthonous population in Badghyz in Turkmenistan, where Kaczensky and Linnell 2015 still recorded 59 observations of the species became most likely extirpated during recent years (Kaczensky, pers. comm. 2018). The largest population is currently the reintroduced population in Altyn Emel NP in Kazakhstan. Two more reintroduced populations in Kazakhstan are much smaller and a third group is currently in the stage of being established. The population sizes and trends of four more reintroduced populations (three in Turkmenistan, one transboundary with Uzbekistan) are currently not exactly known, but all are small, most likely declining, mainly driven by poaching, and some might already be extirpated (Rustamov, pers. comm. 2018). All reintroduced populations originate from few founder animals and some have gone through even two or three genetic bottlenecks.

The third subspecies occurring in the Aol, the Persian wild ass or onager *E.h. ssp. onager* has not been separately classified in The IUCN Red List. Its population size is the smallest of all Asiatic wild ass subspecies, with some subpopulations having shown positive trends and others severe declines (Kaczensky et al., 2015 a).

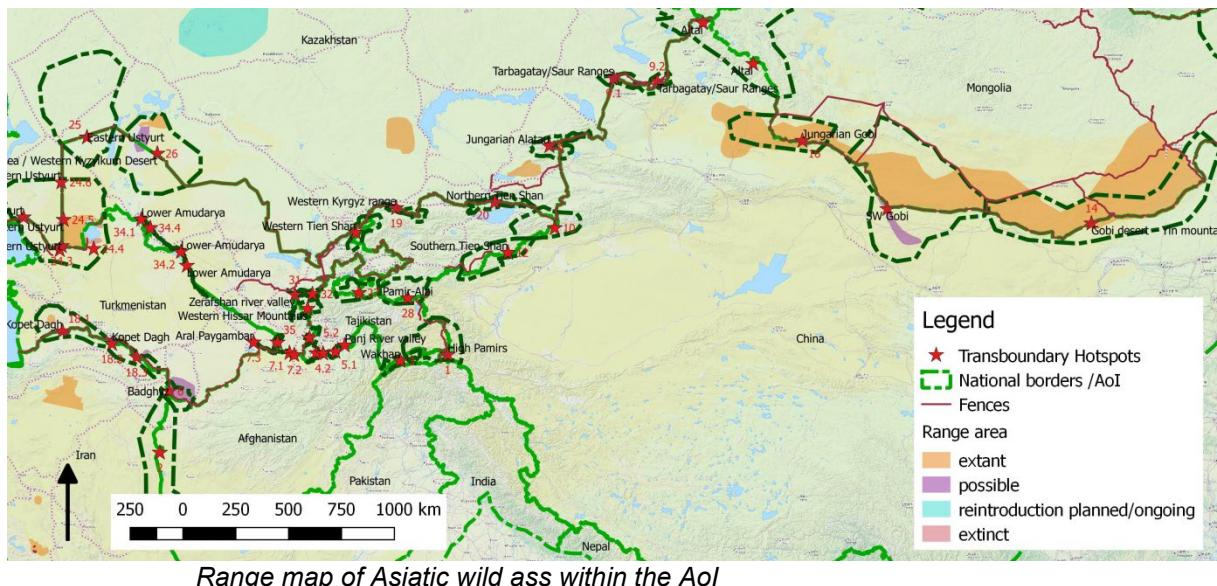
Range areas

The Mongolian wild ass (khulan) has an apparently continuous range area from northern Xinjiang province of China through the entire southern Gobi in Mongolia. Genetic analysis of samples collected from 2002–2005 suggested gene flow over the entire range in Mongolia (Kaczensky et al., 2011), but this may have been compromised by recent infrastructure development (Kaczensky et al., 2015a). With the upgrading of the fence along the international border in the 1980s and 1990s, population exchange between Mongolia and China has likely ceased or at least become minimal (Kaczensky et al., 2011a, Kaczensky unpubl. data). Consequently, the Chinese populations should be regarded as separate from Mongolia. (Kaczensky et al., 2015 a)

The Turkmen wild ass (kulan) most likely recently became extirpated from its last autochthonous range area. Currently there are three sites with reintroduced populations in Kazakhstan, three in Turkmenistan only (possibly some already) extirpated, and one

transboundary range area between Turkmenistan (possibly already extirpated; Murzakhanov pers. comm. 2019) and Uzbekistan (likely expanding also into Kazakhstan). In Kazakhstan reintroduction at one new side has started in 2018. In terms of known population numbers and trends currently only two sites (Altyn Emel NP and Barsa-Kelmes SPA/western Aral Sea in Kazakhstan) can be considered secure. In all other sites the risk of extirpation within a short period is high.

The Persian wild ass (onager) is restricted to three sites (two autochthonous, one very small reintroduced; map in Kaczensky et al., 2015 a) and reintroduction into a fourth site is planned (CAMI Atlas).



activity. While there might be still some small reintroduced populations of kulan in the Kopetdagh in Turkmenistan any movements into Iran are effectively prevented by the border fence.

Proposed TA of significance for the species

ID No.	6	Working Name	Badghyz
Countries	Afghanistan, Iran, Turkmenistan		
Geographic location	Hills between Badghyz province (Afghanistan) and Mary (Turkmenistan)		
Coordinates	N 35.394097°, E 62.892003°; N 35.891563°, E 63.466927°		

ID No.	14	Working Name	Gobi desert – Yin mountains
Countries	China, Mongolia		
Geographic location	To be defined! Possibly several separate sections.		
Coordinates	N 42.163084°, E 106.423024°		

ID No.	15	Working Name	South-western Gobi
Countries	China, Mongolia		
Geographic location	Mongolian Trans-Altai Gobi desert, largely identical with Great Gobi A SPA.		
Coordinates	N 42.683870°, E 96.422978°		

ID No.	16	Working Name	Jungarian Gobi
Countries	China, Mongolia		
Geographic location	Great Gobi B SPA; Khovd-Xinjiang		
Coordinates	N 45.087319°, E 92.261473°		

ID No.	24	Working Name	South-western Ustyurt
Countries	Kazakhstan, Turkmenistan, Uzbekistan		
Geographic location	Ustyurt SPA and areas south of it; Kaplankyr Plateau se of shor (TKM), chink = border between KAZ-TKM, UZB-TKM; Kazakhly shor; Kaplankyr SPA south of Sarygamys lake; areas south of the road Barsa Kelmes – Jaslyk		
Coordinates	N 42.382329°, E 54.111493°; N 41.194460°, E 55.881960°; N 41.235781°, E 57.550095°; N 42.293289°, E 56.077211°; N 43.634792°, E 55.961138°		

ID No.	26	Working Name	Aral Sea / Western Kyzylkum Desert
Countries	Kazakhstan, Uzbekistan		
Geographic location	E Aral Sea with Barsa-Kelmes SPA/BR		
Coordinates	N 44.642783°, E 60.664708°		

3.7 Chinkara *Gazella bennettii*

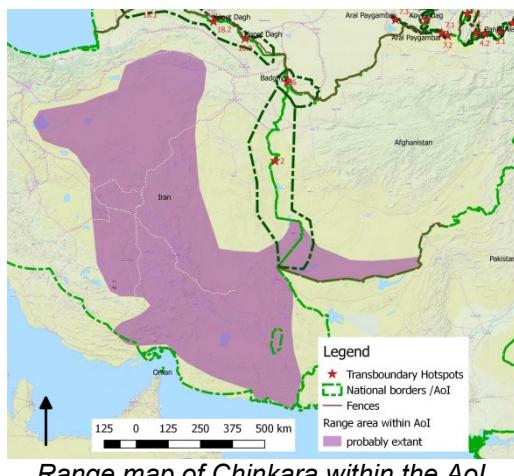
Status

The IUCN Red List assessed Chinkara as LC, but declining because of “over-hunting”. Numbers are still high and there is no evidence that the rate of decline is close to meeting a threshold for threatened status. (IUCN SSC Antelope SG, 2017a)

The global population is mainly in India and Pakistan. Within the AoI they are very rare with no figures known for Afghanistan and around 1,300 estimated for Iran in 2001. (IUCN SSC Antelope SG, 2017a)

Range areas

The exact range areas of chinkara are not known. The maps in the CAMI Atlas and in The IUCN Red List show large areas, but it is unclear what parts of these are actually occupied by the species.



Range map of Chinkara within the AoI

Range States

- Afghanistan, Iran (extant);
- Outside of the AoI: India, Pakistan (extant)

Conservation significance of transboundary populations, migrations and movements

Given the low numbers inside the AoI, the unknown range areas and the rather large population outside of the AoI the conservation significance of possible transboundary populations, migrations and movements cannot be assessed. Any transboundary populations, if existing, are unlikely to be affected by typical border related threats, but more by general poaching, habitat degradation and drought.

Proposed TA of significance for the species

ID No.	2	Working Name
Countries		Afghanistan, Iran
Geographic location		Entire border area
Coordinates		N 33.320370°, E 60.789269° (most southern areas only, if at all)

3.8 Goitered gazelle *Gazella subgutturosa*

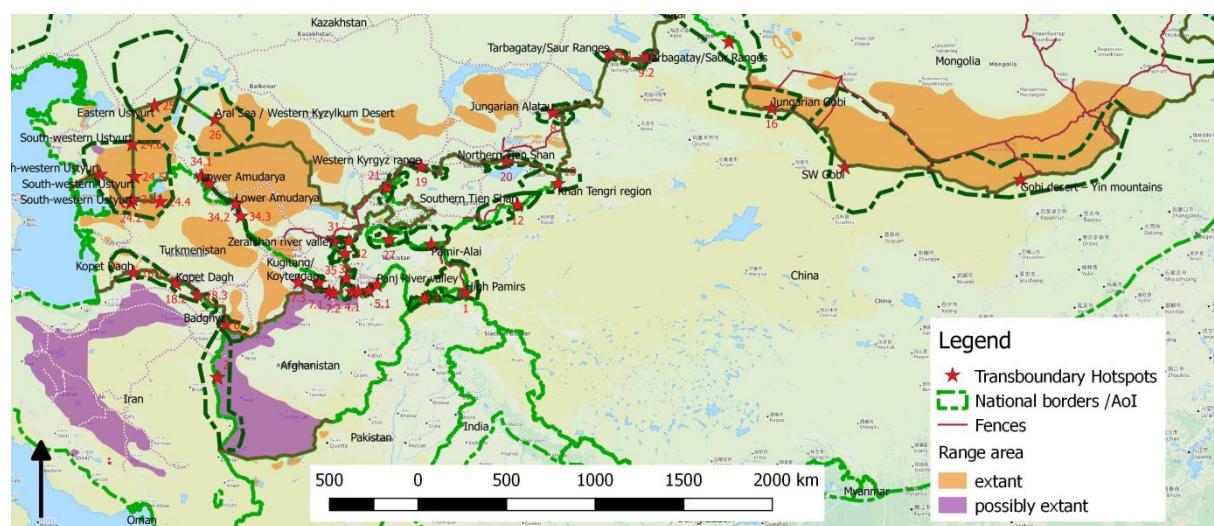
Status

The goitered gazelle in The IUCN Red List globally is assessed as EN (IUCN SSC Antelope SG, 2017b). Population numbers are declining and there seems to be a substantial discrepancy between the huge range area indicated in the map and the guessed population numbers, indicating low densities and local extinctions over large areas. Continuing illegal hunting and habitat loss are the main reasons indicated by IUCN SSC Antelope SG (2017b).

As an example of the general trends the IUCN SSC Antelope SG (2017b) stated that the former population in Turkmenistan has virtually disappeared. Rustamov (pers. comm. 2018) assumed that in 2014 at least about 850 goitered gazelles (plus about 500 at an island in the Caspian Sea) existed in Turkmenistan, while the Red Book of Turkmenistan indicated 4, 200 individuals and an increasing population (Annabayramov, 2011). Also in Mongolia, holding an estimated 40-50% of the global population, the population size has been heavily reduced by poaching and this decline is continuing (IUCN SSC Antelope SG, 2017b). In North-western China (Abduriyim, 2018) and Iran (Khosravi et al., 2019) numbers of goitered gazelles have reportedly declined in an extent, which has already caused low genetic diversity. Numbers in Kazakhstan and Uzbekistan are unknown but certainly much below the potential of the available habitat. Substantial populations exist in Altyn Emel NP (Kazakhstan) and in the fenced “Ecocenter Jeyran” (Uzbekistan). In Kyrgyzstan goitered gazelle is extinct with last documented observations at the southern edges of Issyk-Kul Lake in 2005 and in Lyalyak district in 2007 (Davletbakov and Michel, 2015). In Tajikistan goitered gazelle occurs in two small populations and is close to extinction.

Range areas

While The IUCN Red List (IUCN SSC Antelope SG, 2017b) presents a large and contiguous range area of the species, the CAMI Atlas shows a much more fragmented distribution. The range area in China is missing in the CAMI Atlas. The low population numbers, however, make it likely that over large parts of these distribution patches the species is already extinct or occurs only occasionally. E.g., Khosravi et al. (2019) state that in Iran the remnant populations are confined to fragmented habitats. Often such small range areas are effectively isolated. Such populations can survive for decades, as e.g. the gazelles north of Kayrakkum Reservoir in Tajikistan (Michel et al., 2009), but such groups are particularly prone to become extirpated and low genetic diversity even after a recovery of such small groups may threaten their long-term survival (Abduriyim, 2018; Khosravi et al., 2019).



Range map of Goitered gazelle within the AoI

Range States

- China, Iran, Mongolia, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan (extant)
- Afghanistan, Kyrgyzstan (probably extinct);
- Outside of the Aol: Azerbaijan, Pakistan (extant); Armenia (extinct); Georgia (reintroduced)

Conservation significance of transboundary populations, migrations and movements

Several of the range areas indicated in the CAMI Atlas are certainly transboundary. However, existing barriers may limit movements across international borders although goitered gazelles are known to jump well and can possibly cross some border fences. The Kyzylkum range area, east of the Aral Sea is shared between Kazakhstan and Uzbekistan, but Gritsyna et al. (2016) consider the fence a serious threat possibly blocking access to seasonally critical habitats and causing injuries and mortality in the case of crossing attempts (injured gazelles reported by Kazakhstan border guards from southern Ustyurt (Pestov pers. comm. 2019)). The areas in the southern Ustyurt, shared by Kazakhstan, Turkmenistan and Uzbekistan are locally cut by two fences, which may form effective barriers or even traps. Several range areas seem to end at national borders, e.g. in the northern/eastern Ustyurt between Kazakhstan and Uzbekistan or in the Kopetdagh between Iran and Turkmenistan. But in what extent the species really occurs at any side of the respective border might not be exactly known. Some of these border areas may actually have no gazelles anymore; others may have unrecorded transboundary populations. Given the large extent of suitable habitat with very low numbers of goitered gazelles inside of each range state, transboundary populations, migrations and movements might be of only secondary importance for the conservation of the species and its local populations.

Proposed TA of significance for the species

ID No.	2	Working Name	
Countries	Afghanistan, Iran		
Geographic location	Entire border area		
Coordinates	N 33.320370°, E 60.789269°		

ID No.	6	Working Name	Badghyz
Countries	Afghanistan, Iran, Turkmenistan		
Geographic location	Hills between Badghyz province (Afghanistan) and Mary (Turkmenistan)		
Coordinates	N 35.394097°, E 62.892003°; N 35.891563°, E 63.466927°		

ID No.	18	Working Name	Kopet Dagh
Countries	Iran, Turkmenistan		
Geographic location	Entire mountain range		
Coordinates	N 38.138427°, E 56.020189°; N 37.649680°, E 58.440410°; N 37.131702°, E 59.647731°		

ID No.	24	Working Name	South-western Ustyurt
Countries	Kazakhstan, Turkmenistan, Uzbekistan		
Geographic location	Ustyurt SPA and areas south of it; Kaplankyr Plateau se of shor (TKM), chink = border between KAZ-TKM, UZB-TKM; Kazakhly		

	shor; Kaplankyr SPA south of Sarygamysh lake; areas south of the road Barsa Kelmes – Jaslyk
Coordinates	N 42.382329°, E 54.111493°; N 41.194460°, E 55.881960°; N 41.235781°, E 57.550095°; N 42.293289°, E 56.077211°; N 43.634792°, E 55.961138°

ID No.	25	Working Name	Eastern Ustyurt
Countries	Kazakhstan, Uzbekistan		
Geographic location	Ustyurt east of Atyrau-Nukus road; Saygachiy reserve		
Coordinates	N 45.207123°, E 57.217359°		

ID No.	26	Working Name	Aral Sea / Western Kyzylkum Desert
Countries	Kazakhstan, Uzbekistan		
Geographic location	E Aral Sea with Barsa-Kelmes SPA/BR		
Coordinates	N 44.642783°, E 60.664708°		

ID No.	33	Working Name	Babatag
Countries	Tajikistan, Uzbekistan		
Geographic location	Babatag Mountains along the border		
Coordinates	N 37.877689°, E 68.114596°		

3.9 Argali *Ovis ammon*

Status

The argali is assessed as NT in The IUCN Red List (Harris and Reading 2008). This assessment would need an update, but there is a lack of recent reliable data across the range area. Following the listing of the argali on Appendix II of CMS in 2011, an International Single Species Action Plan has been prepared in cooperation with Range States and international experts, and with financial support of the German Federal Government and the European Union and has been adopted at CMS CoP 11 in November 2014 (CMS, 2014).

The IUCN Caprinae Specialist Group recognizes nine subspecies (CMS, 2014):

<i>Ovis ammon ammon</i>	- Altai argali
<i>Ovis ammon collium</i>	- Kazakhstan argali
<i>Ovis ammon darwini</i>	- Gobi argali
<i>Ovis ammon hodgsoni</i>	- Tibetan argali
<i>Ovis ammon jubata</i>	- North China argali, Shansi argali
<i>Ovis ammon karelini</i>	- Tian Shan argali
<i>Ovis ammon nigrimontana</i>	- Karatau argali
<i>Ovis ammon polii</i>	- Marco Polo sheep, Pamir argali
<i>Ovis ammon severtzovi</i>	- Severtzov's argali.

Different stakeholders not always apply this classification consistently and the assignment of certain populations to one or another subspecies can vary with consequences for the status assessment and legal regulation concerning the respective population or subspecies. A phenotype-based classification is adopted by the CIC International Council for Game and Wildlife Conservation, which identifies 15 argali phenotypes and is intended to be complementary to formal taxonomy. The Safari Club International (SCI 2002) classification system for wild sheep recognizes 14 argali subspecies. (CMS, 2014)

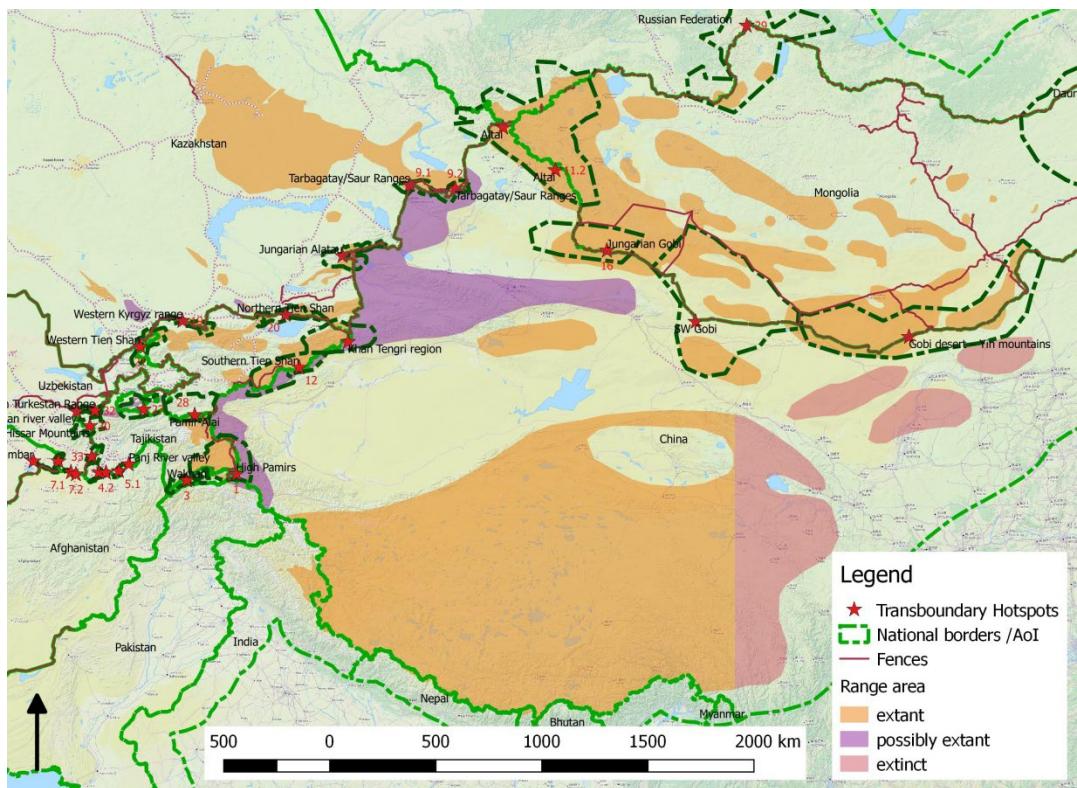
No global estimates of the total population size are provided in The IUCN Red List (Harris and Reading 2008) and the Single Species Action Plan (CMS, 2014). Summarizing the numbers provided by Harris and Reading (2008) the total population size might have been around 85,000 animals, and the figures in CMS (2014) suggest even a total number of about 107,000 argali. But available figures are of varying reliability and refer to different spatial and temporal scales. Apparent increases in numbers are likely mainly due to more intensive surveys. Area-specific reports suggest locally stable or increasing population sizes, but over large areas trends of decline. Major causes of decline are poaching and increasing livestock grazing in argali habitats causing displacement, forage competition, habitat degradation and disease transmission. Barriers to migration in form of border fences in some areas prevent access to key seasonal habitats.

On the other hand successful protection from poaching has been incentivized by income from sport hunting in assigned game management areas in some countries, while some trophy hunting has not been beneficial for the conservation of the respective populations. Where illegal and unethical practices, like shooting more than one animal per license and manipulating of trophies occur abundance of old rams and quality of trophies have declined.

Range areas

The map of argali range areas in the CAMI Atlas is based on the map in The IUCN Red List, but has been revised and differentiates areas where argali are extant, probably extant, possibly extant (or occupancy is questionable) or extinct. The extent of some range areas within the AoI of this study is well known. Some range areas, e.g., in central and eastern Kazakhstan, Mongolia and northwestern China, are rather generalized and include large

unoccupied areas. The range area in China's Tibetan plateau is extremely generalized and the available population figures suggest that large sections of the mapped range areas are not occupied by argali.



Range map of argali within the AoI

Range States

- Afghanistan, China, Iran, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Uzbekistan (extant);
- Outside of the AoI: India, Nepal, Pakistan (extant);

Conservation significance of transboundary populations, migrations and movements

The overall large range area of argali may suggest that transboundary populations, migrations and movements might be of relatively lower significance for the conservation of the species. However, there are several populations and subspecies, which have their key habitats and the highest numbers of individuals in areas close to national borders or are transboundary in a substantial extent. For instance, argali in the Altai move seasonally between Mongolia and Russia, in the Pamirs some argali groups move between Afghanistan, China and Tajikistan, in the Jungarian Alato, Tarbagatay and Saur Mountain ranges argali move between China and Kazakhstan, in the Tien Shan movements occur between China, Kazakhstan and Kyrgyzstan and in the Turkestan Range between Kyrgyzstan, Tajikistan and Uzbekistan. Survival of argali in China's Inner Mongolia is likely to depend on the ability of dispersing individuals from Mongolia to supplement existing groups or colonize new areas (Harris et al., 2009). Also in Pakistan continuing argali presence is likely dependent on migrations from China (Haider et al., 2018).

Argali populations in many transboundary areas are fragmented by border fences, which hinder migrations and movements, reducing effective population sizes, hampering access to essential seasonal habitats and forage resources (e.g., reported from the Altai between Mongolia and Russia) and reducing genetic exchange and diversity (Luikart et al., 2011;

Rosen, 2012). In some areas, like along sections of the border between Kazakhstan and China, argali habitats are fragmented by two parallel fences. Transboundary collaboration in such areas should primarily aim at the restoration of connectivity and at joint population monitoring and coordinated conservation management.

Proposed TA of significance for the species

ID No.	1	Working Name	High Pamirs
Countries	Afghanistan, China, Tajikistan		
Geographic location	South-eastern Tajik Pamirs, Great and Little Pamir, Sarikol Pamir (Tashkorgan)		
Coordinates	N 37.225377°, E 74.889355°		

ID No.	8	Working Name	Jungarian Alatau
Countries	China, Kazakhstan		
Geographic location	Jungarian Alatau, entire mountain area		
Coordinates	N 44.908111°, E 79.868378°		

ID No.	9	Working Name	Tarbagatay/Saur Ranges
Countries	China, Kazakhstan		
Geographic location	Continuous area along the China-Kazakhstan border		
Coordinates	N 47.212407°, E 83.021317°; N 47.100329°, E 85.150187°		

ID No.	10	Working Name	Khan Tengri region
Countries	China, Kazakhstan, Kyrgyzstan		
Geographic location	Khan Tengri massif in the Tian Shan, incl. Khan Tengri NP in Kyrgyzstan		
Coordinates	N 41.993587°, E 80.126861°		

ID No.	11	Working Name	Altai
Countries	China, Kazakhstan, Mongolia, Russia		
Geographic location	N-Central part and SE part of Altai mountains		
Coordinates	N 49.006372°, E 87.394649°; N 47.681114°, E 89.849796°		

ID No.	12	Working Name	Southern Tien Shan
Countries	China, Kyrgyzstan		
Geographic location	Entire mountain range along border with China		
Coordinates	N 41.092293°, E 77.839644°		

ID No.	14	Working Name	Gobi desert – Yin mountains
Countries	China, Mongolia		
Geographic location	To be defined! Possibly several separate sections.		
Coordinates	N 42.163084°, E 106.423024°		

ID No.	15	Working Name	South-western Gobi
Countries	China, Mongolia		
Geographic location	Mongolian Trans-Altai Gobi desert, largely identical with Great Gobi A SPA.		

Coordinates	N 42.683870°, E 96.422978°
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ID No.	19	Working Name	Western Kyrgyz range
Countries	Kazakhstan, Kyrgyzstan		
Geographic location	Kyrgyz range in Jambyl province (Kazakhstan) and Talas province (Kyrgyzstan)		
Coordinates	N 42.718098°, E 72.363159		

ID No.	20	Working Name	Northern Tien Shan
Countries	Kazakhstan, Kyrgyzstan		
Geographic location	Zaili-Alatoo and Kungey-Alatoo		
Coordinates	N 42.927080°, E 77.195160°		

ID No.	21	Working Name	Western Tien Shan
Countries	Kazakhstan, Kyrgyzstan, Uzbekistan		
Geographic location	Ugam-Chatkal NP, Chatkal SPA, Aksu-Zhabagly SPA, Besh Aral SPA		
Coordinates	N 41.824316°, E 70.385352°		

ID No.	27	Working Name	Eastern Turkestan Range
Countries	Kyrgyzstan, Tajikistan		
Geographic location	Hissaro-Alai system (eastern Turkestan Range)		
Coordinates	N 39.497213°, E 69.906661°		

ID No.	28	Working Name	Pamir-Alai
Countries	Kyrgyzstan, Tajikistan, Uzbekistan		
Geographic location	Transalai and Alai ranges, Alai valley		
Coordinates	N 39.549400°, E 71.902699°		

ID No.	29	Working Name	Sayan
Countries	Mongolia, Russia		
Geographic location	Tuva/Irkutsk prov./Buryatiya – Khovsgol		
Coordinates	N 52.040283°, E 98.815337°		

ID No.	32	Working Name	Western Turkestan Range
Countries	Tajikistan, Uzbekistan		
Geographic location	Turkestan Range west of Shahristan		
Coordinates	N 39.550563°, E 68.262615°		

3.10 Urial *Ovis vignei*

Status

The most recent assessment of their conservation status in The IUCN Red List treated urial and mouflon as one single species *Ovis orientalis*, which is assigned the category VU (Valdez 2008). Considering these two taxa as distinct species *Ovis gmelini* and *Ovis vignei* would be more coherent with their past evolutionary divergence and the resulting morphological and genetic differences between them. The ongoing reassessment follows this approach, which is also applied here.

Urial is divided into several subspecies:

<i>Ovis vignei arkal</i>	-	Transcaspian urial
<i>Ovis vignei blanfordi</i>	-	Blanford's urial
<i>Ovis vignei bochariensis</i>	-	Bukhara urial
<i>Ovis vignei cycloceros</i>	-	Afghan urial
<i>Ovis vignei punjabensis</i>	-	Punjab urial
<i>Ovis vignei vignei</i>	-	Ladakh urial

The taxonomic status of several subspecies, their geographic distribution and the belonging of distinct populations to these are debated. Urial and mouflon *Ovis gmelini* form natural and stable hybrid populations in parts of Iran. (IUCN SSC/Caprinae Specialist Group 2000)

The reassessment is challenged by insufficient coverage and quality of available data, in particular from Iran, the Range State with likely the largest population size of the species, but also from most other parts of the range. Most population data are educated guesses or refer to small areas only. Data availability for distinct time periods is not sufficient to provide an indication of size and trends of global population size.

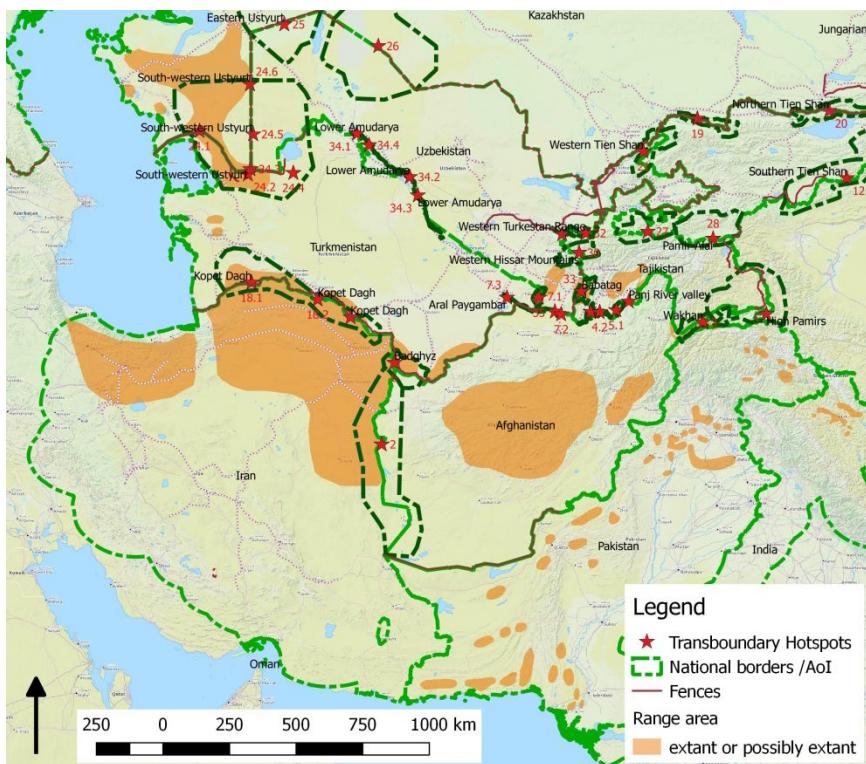
Available information suggests that urial populations are fragmented and many populations are small and/or declining. The main reasons of decline are poaching, capture of lambs as pets, competition with domestic livestock and habitat degradation. Where not poached urial populations can quickly recover, can coexist with human activities like livestock grazing and even cause damage to agriculture. Stable and increasing populations are found in the Wakhan of Afghanistan, some protected areas in Iran and outside of the AoI in India and in areas with community-based hunting programs in parts of Pakistan. In Turkmenistan rapid declines happened during the last years, with Rustamov (pers. comm. 2018) reporting an overall decline from 6,100 reported in the Red Book (Annabayramov, 2011) to less than 3,000 and local declines by up to 90%. Ismailov (pers. comm., 2019) indicated declines by more than 70% in Kazakhstan during the last 20 years.

Hybridization might become a threat to the genetic integrity of wild populations where both species are bred together in hunting enclosures, like in Tajikistan.

Range areas

The range areas shown in the map are of highly varying accuracy. Most range areas indicated as "extant" are very generalized and the actually occupied areas are much smaller. This concerns in particular the large blocks in the Ustyurt between Aral Sea and Caspian Sea, in northern Iran and Afghanistan. The areas indicated as "possibly extant" consist in a large extent of unsuitable areas and there only some small patches of actual urial range areas can be expected.

Thus the overall range of the species is very fragmented and most populations are isolated.



Range map of urial within the AoI (Source Valdez, 2008, modified by Michel)

Range States

- Afghanistan, Iran, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan (extant)
- Outside of the AoI: India, Pakistan (extant); Oman (introduced?)

Conservation significance of transboundary populations, migrations and movements

Large parts of the range and population size of the species are either not transboundary or migrations and movements are poorly known. Populations of Turkmenistan are potentially transboundary with Afghanistan, Iran, Kazakhstan and Uzbekistan, but movements are hindered by border fences (high chain link with cover of barbed wire). Reportedly (Pestov, pers. comm. 2019) the barbed wire fences of medium height at the Kazakhstan side of the Kazakhstan-Turkmenistan borders are at least occasionally crossed by urials, but it is unclear if they crawl through the fence or jump it. For some populations national borders may coincide with natural barriers, like in the case of the lower Panj River between Afghanistan and Tajikistan or the highest sections of the Hindu Kush Range between Afghanistan and Pakistan. The probably largest remaining populations of Bukhara urial in the southwest of Tajikistan and south of Uzbekistan is likely transboundary in the Babatag Mountains. The population of Ladakh urial in the Wakhan of Afghanistan stretches over one mountain pass into northern Pakistan and seems to be the source population of urial groups occasionally observed in the Pamirs of Tajikistan. Thus transboundary populations and movements are of high significance for the conservation of certain populations and subspecies.

Proposed TA of significance for the species

ID No.	2	Working Name	
Countries	Afghanistan, Iran		
Geographic location	Entire border area		
Coordinates	N 33.320370°, E 60.789269°		

ID No.	3	Working Name	Wakhan
Countries	Afghanistan, Tajikistan		
Geographic location	Wakhan corridor and upper Panj from downstream of Eshkashem up to Sarhad-e Baroghil (Afghanistan) and Tupkhana valley(Tajikistan)		
Coordinates	N 36.988622°, E 72.568698°		

ID No.	6	Working Name	Badghyz
Countries	Afghanistan, Iran, Turkmenistan		
Geographic location	Hills between Badghyz province (Afghanistan) and Mary (Turkmenistan)		
Coordinates	N 35.394097°, E 62.892003°; N 35.891563°, E 63.466927°		

ID No.	18	Working Name	Kopet Dagh
Countries	Iran, Turkmenistan		
Geographic location	Entire mountain range		
Coordinates	N 38.138427°, E 56.020189°; N 37.649680°, E 58.440410°; N 37.131702°, E 59.647731°		

ID No.	24	Working Name	South-western Ustyurt
Countries	Kazakhstan, Turkmenistan, Uzbekistan		
Geographic location	Ustyurt SPA and areas south of it; Kaplankyr Plateau se of shor (TKM), chink = border between KAZ-TKM, UZB-TKM; Kazakhly shor; Kaplankyr SPA south of Sarygamys lake; areas south of the road Barsa Kelmes – Jaslyk		
Coordinates	N 42.382329°, E 54.111493°; N 41.194460°, E 55.881960°; N 41.235781°, E 57.550095°; N 42.293289°, E 56.077211°; N 43.634792°, E 55.961138°		

ID No.	33	Working Name	Babatag
Countries	Tajikistan, Uzbekistan		
Geographic location	Babatag Mountains along the border		
Coordinates	N 37.877689°, E 68.114596°		

ID No.	35	Working Name	Kugitang/Koytendag
Countries	Turkmenistan, Uzbekistan		
Geographic location	Koytendag SPA and Surkhan SPA		
Coordinates	N 37.701902°, E 66.552273°		

3.11 Persian leopard *Panthera pardus saxicolor*

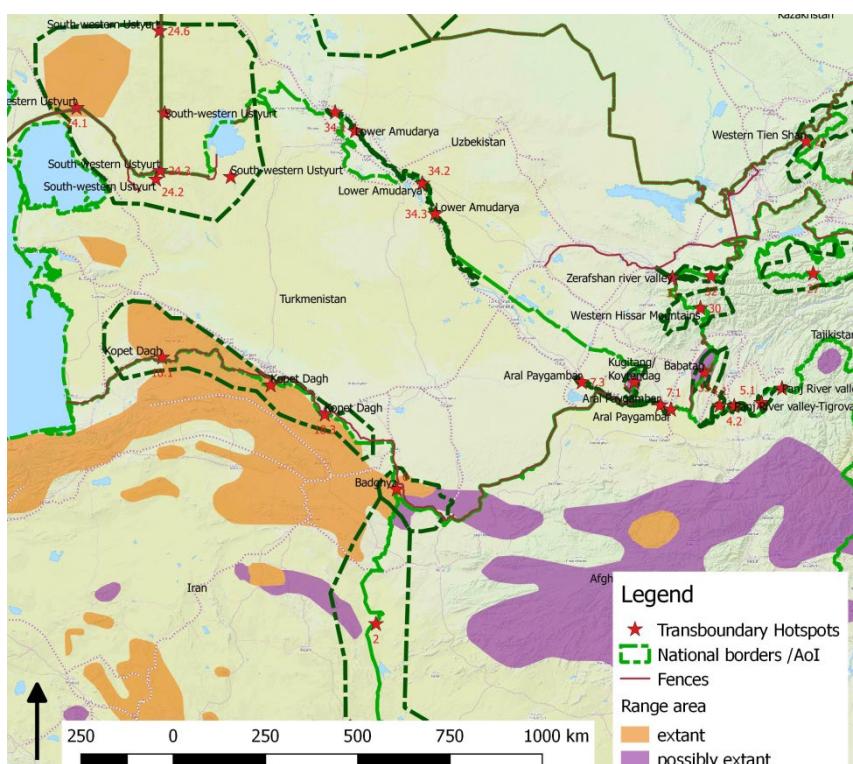
Status

The leopard as entire species is assessed by Stein et al. (2016) as VU in The IUCN Red List. The subspecies Persian leopard was assessed in The IUCN Red List in 2008 and according to Stein et al. (2016) should retain the status Endangered (EN C2a(i)): 800-1,000 (Khorozyan, 2008). Despite the subspecies has been recorded in previously undocumented areas of the Caucasus and in Kazakhstan, however, due to overall low numbers, restricted range and overall population decline the Red List category remains unchanged. The main threat is illegal killings, mainly in the context of (perceived) human-wildlife conflict.

Range areas

The current range area of Persian leopards represents only a patchwork of tiny sections of its previous distribution. Thanks to long-distance movements of several hundred kilometers the populations in the remaining range areas may still be in some extent connected, at least through the migration of young males. In 2018 a male leopard was recorded for the third time after 2007 and 2015 in the Ustyurt of Kazakhstan, where the species so far has not been considered as part of the native fauna. However, probably, the fact that females tend to be much less mobile and to remain close to the area where they were born makes the colonization of new areas by reproducing groups a rather rare occasion.

Most leopards occur in Iran's Zagros and Alborz Mountains and adjacent areas. Other confirmed range areas within the AoI are the Kopetdagh Mountains at the border of Iran and Turkmenistan and in Afghanistan's Central Plateau. There might still be leopards in areas where it had occurred in the past – the Babatag Mountains at the border of Tajikistan and Uzbekistan, in the Koytendagh/Kugitang, shared between Turkmenistan and Uzbekistan and in Afghanistan's Badakhshan province. In particular in the Kugitang and Babatag (and adjacent Baysuntai and southern Hissar Range) of Uzbekistan oral reports by a number of people suggest that leopards are still present there (Marmazinskaya, 2016)



Range map of Persian leopard within the AoI

Range States

- Afghanistan, China, Iran, Kazakhstan, Turkmenistan (extant)
- Pakistan, Tajikistan, Uzbekistan (possibly extinct);
- Outside of the AoI: Armenia, Azerbaijan, Iraq (extant); Georgia (extinct); Russia (reintroduced)

Conservation significance of transboundary populations, migrations and movements

Except some areas in Iran and in Afghanistan's Central Plateau, most confirmed or suspected range areas of the leopards are located close to or across national borders. Border areas are often least populated areas in the AoI, which has increased the chance that leopards survived there. Furthermore, the overall low numbers of leopards, their large individual home ranges, long-distance movements and the need for genetic exchange between fragmented subpopulations require conservation activities for the species' transboundary range areas and populations.

Proposed TA of significance for the species

ID No.	2	Working Name	
Countries	Afghanistan, Iran		
Geographic location	Entire border area		
Coordinates	N 33.320370°, E 60.789269°		

ID No.	6	Working Name	Badghyz
Countries	Afghanistan, Turkmenistan		
Geographic location	Hills between Badghyz province (Afghanistan) and Mary (Turkmenistan)		
Coordinates	N 35.394097°, E 62.892003°; N 35.891563°, E 63.466927°		

ID No.	7	Working Name	Aral Paygamar
Countries	Afghanistan, Uzbekistan		
Geographic location	Riparian areas near Termez, incl. former Aral Paygamar SPA, closed in the 1990s and upstream of "friendship" bridge		
Coordinates	N 37.297403°, E 67.137200°; N 37.219264°, E 67.368819°		

ID No.	18	Working Name	Kopet Dagh
Countries	Iran, Turkmenistan		
Geographic location	Entire mountain range		
Coordinates	N 38.138427°, E 56.020189°; N 37.649680°, E 58.440410°; N 37.131702°, E 59.647731°		

ID No.	24	Working Name	South-western Ustyurt
Countries	Kazakhstan, Turkmenistan, Uzbekistan		
Geographic location	Ustyurt SPA and areas south of it; Kaplankyr Plateau se of shor (TKM), chink = border between KAZ-TKM, UZB-TKM; Kazakhly shor; Kaplankyr SPA south of Sarygamys lake; areas south of the road Barsa Kelmes – Jaslyk		
Coordinates	N 42.382329°, E 54.111493°; N 41.194460°, E 55.881960°; N 41.235781°, E 57.550095°; N 42.293289°, E 56.077211°; N 43.634792°, E 55.961138°		

ID No.	33	Working Name	Babatag
Countries	Tajikistan, Uzbekistan		
Geographic location	Babatag Mountains along the border		
Coordinates	N 37.877689°, E 68.114596°		

ID No.	35	Working Name	Kugitang/Koytendag
Countries	Turkmenistan, Uzbekistan		
Geographic location	Koytendag SPA and Surkhan SPA		
Coordinates	N 37.701902°, E 66.552273°		

3.12 Snow leopard *Panthera uncia*

Status

The snow leopard has been assessed in The IUCN Red List as VU by McCarthy et al. (2017). This assessment was based on the total numbers provided by the Range States, the recalculation of the share of mature individuals within the entire population and reconsideration of likely densities across the snow leopard's large distribution range. This assessment and the assigned category have been challenged by various NGOs and individuals, e.g., Ale and Mishra (2018), mainly without rigorous application of the Guidelines for Using the IUCN Red List Categories and Criteria⁸ and assuming that the change from EN to a category of lower extinction risk may have negative implications for the conservation of the species, but also considering the low percentage of the snow leopard range area covered by scientific population surveys. As there is no alternative justified assessment of the snow leopard's status the alternatively applicable category could only be Data deficient (DD), which would not be appropriate if comparing the knowledge about this charismatic species with most other assessed taxa.

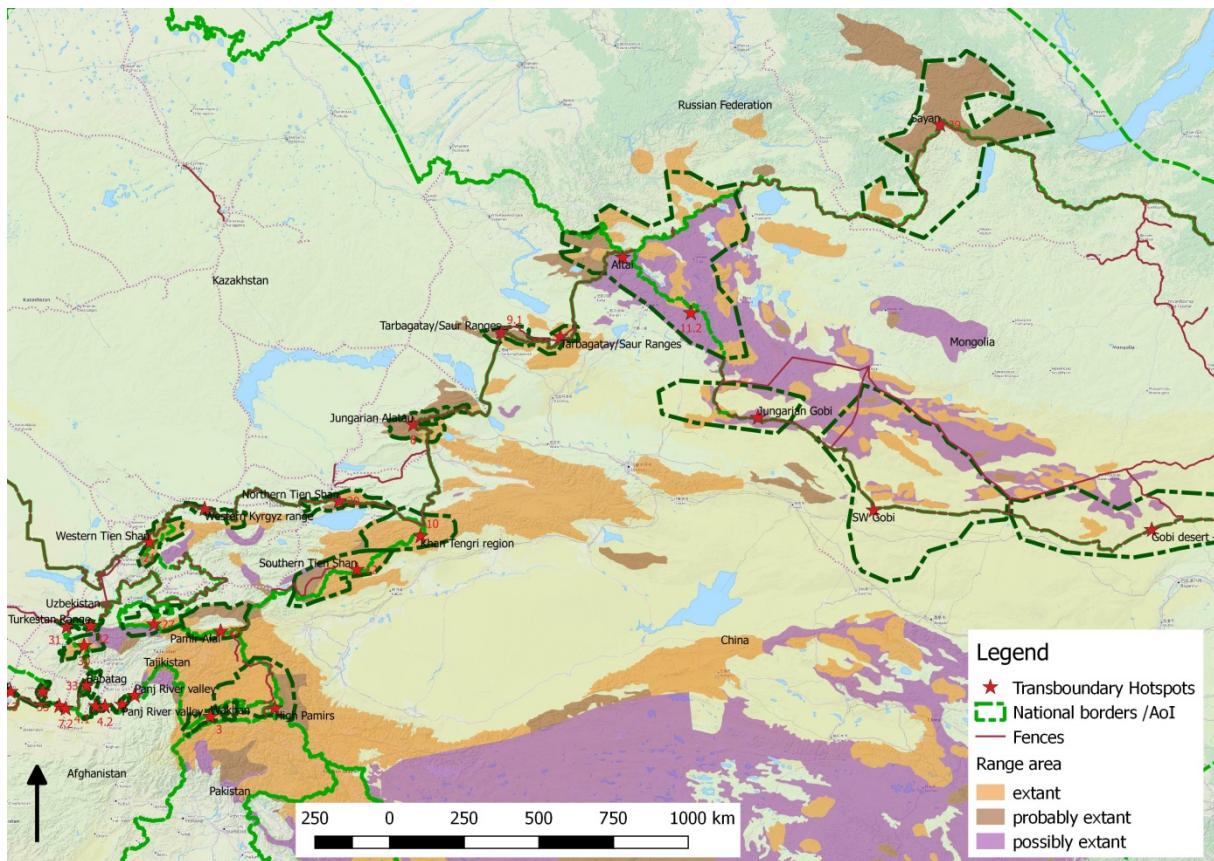
Range areas

The snow leopard's range areas appear largely well connected from the northern part in the Altay, Sayan and adjacent mountain ranges, through the Saur, Tarbagatay, Jungarian Alatoo, Tien Shan and Pamir Mountains to the southern part of the range area in the Hindukush, Karakoram, Himalaya and Tibetan Plateau.

However, there might already be some fragmentation of the distribution range, in particular in its northern and southeastern parts. Climate change may in the future cause further habitat fragmentation (e.g., Lovari et al., 2013).

Lukarevski (pers. comm. 2015) has expressed concerns that in some smaller range area patches in the Russian Federation the snow leopards may go extinct because of the low likelihood that reproducing females recolonize abandoned home ranges as females in contrast to males rarely carry out long distance movements, although such movements over hundreds of kilometers have been documented from collared individuals (e.g., McCarthy et al., 2007).

⁸ Latest version 13 (March 2017): <http://www.iucnredlist.org/documents/RedListGuidelines.pdf>



Range map of snow leopard within the AoI

Range States

- Afghanistan, China, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Uzbekistan (extant)
- Outside of the AoI: Bhutan, India, Nepal, Pakistan (extant);

Conservation significance of transboundary populations, migrations and movements

Key range areas of the snow leopard within the AoI are located in areas close to national borders or are transboundary. Many national borders are ridgelines of mountain ranges – either immediate snow leopard habitats or spatially close to these. Due to large home ranges and long-distance movements most snow leopard populations are transboundary and their connectivity across national borders is of utmost importance for maintaining sufficiently large effective population sizes and allowing for the recolonization of abandoned home ranges. Increasing pressure on snow leopard habitats caused by land-use, in particular increasing livestock numbers, and climate change causes fragmentation of range areas and the importance of transboundary connectivity of range areas will even increase.

Transboundary snow leopard areas are divided by border fences, in particular along the borders with China, in some areas two lines of fences run parallel. Typically border fences are not impermeable for snow leopards (Jackson, pers. comm. 2017), but they hamper movements and may cause injuries. Indirectly, border fences affect snow leopards by their negative impact on the fitness of their ungulate prey.

Proposed TA of significance for the species

ID No.	1	Working Name	High Pamirs
Countries	Afghanistan, China, Tajikistan		
Geographic location	South-eastern Tajik Pamirs, Great and Little Pamir, Sarikol Pamir (Tashkorgan)		
Coordinates	N 37.225377°, E 74.889355°		

ID No.	3	Working Name	Wakhan
Countries	Afghanistan, Tajikistan		
Geographic location	Wakhan corridor and upper Panj from downstream of Eshkashem up to Sarhad-e Baroghil (Afghanistan) and Tupkhana valley(Tajikistan)		
Coordinates	N 36.988622°, E 72.568698°		

ID No.	8	Working Name	Jungarian Alatau
Countries	China, Kazakhstan		
Geographic location	Jungarian Alatau, entire mountain area		
Coordinates	N 44.908111°, E 79.868378°		

ID No.	9	Working Name	Tarbagatay/Saur Ranges
Countries	China, Kazakhstan		
Geographic location	Continuous area along the China-Kazakhstan border		
Coordinates	N 47.212407°, E 83.021317°; N 47.100329°, E 85.150187°		

ID No.	10	Working Name	Khan Tengri region
Countries	China, Kazakhstan, Kyrgyzstan		
Geographic location	Khan Tengri massif in the Tian Shan, incl. Khan Tengri NP in Kyrgyzstan		
Coordinates	N 41.993587° E 80.126861°		

ID No.	11	Working Name	Altai
Countries	China, Kazakhstan, Mongolia, Russia		
Geographic location	N-Central part and SE part of Altai mountains		
Coordinates	N 49.006372°, E 87.394649°; N 47.681114°, E 89.849796°		

ID No.	12	Working Name	Southern Tien Shan
Countries	China, Kyrgyzstan		
Geographic location	Entire mountain range along border with China		
Coordinates	N 41.092293°, E 77.839644°		

ID No.	15	Working Name	South-western Gobi
Countries	China, Mongolia		
Geographic location	Mongolian Trans-Altai Gobi desert, largely identical with Great Gobi A SPA.		
Coordinates	N 42.683870°, E 96.422978°		

ID No.	19	Working Name	Western Kyrgyz range
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Countries	Kazakhstan, Kyrgyzstan
Geographic location	Kyrgyz range in Jambyl province (Kazakhstan) and Talas province (Kyrgyzstan)
Coordinates	N 42.718098°, E 72.363159

ID No.	20	Working Name	Northern Tien Shan
Countries	Kazakhstan, Kyrgyzstan		
Geographic location	Zaili-Alatoo and Kungey-Alatoo		
Coordinates	N 42.927080°, E 77.195160°		

ID No.	21	Working Name	Western Tien Shan
Countries	Kazakhstan, Kyrgyzstan, Uzbekistan		
Geographic location	Ugam-Chatkal NP, Chatkal SPA, Aksu-Zhabagly SPA, Besh Aral SPA		
Coordinates	N 41.824316°, E 70.385352°		

ID No.	27	Working Name	Eastern Turkestan Range
Countries	Kyrgyzstan, Tajikistan		
Geographic location	Hissaro-Alai system (eastern Turkestan Range)		
Coordinates	N 39.497213°, E 69.906661°		

ID No.	28	Working Name	Pamir-Alai
Countries	Kyrgyzstan, Tajikistan, Uzbekistan		
Geographic location	Transalai and Alai ranges, Alai valley		
Coordinates	N 39.549400°, E 71.902699°		

ID No.	29	Working Name	Sayan
Countries	Mongolia, Russia		
Geographic location	Tuva/Irkutsk prov./Buryatiya – Khovsgol		
Coordinates	N 52.040283°, E 98.815337°		

ID No.	30	Working Name	Western Hissar Mountains
Countries	Tajikistan, Uzbekistan		
Geographic location	Western section of the Hissaro-Alai mountain range		
Coordinates	N 38.995356°, E 68.027545°		

ID No.	32	Working Name	Western Turkestan Range
Countries	Tajikistan, Uzbekistan		
Geographic location	Turkestan Range west of Shahristan		
Coordinates	N 39.550563°, E 68.262615°		

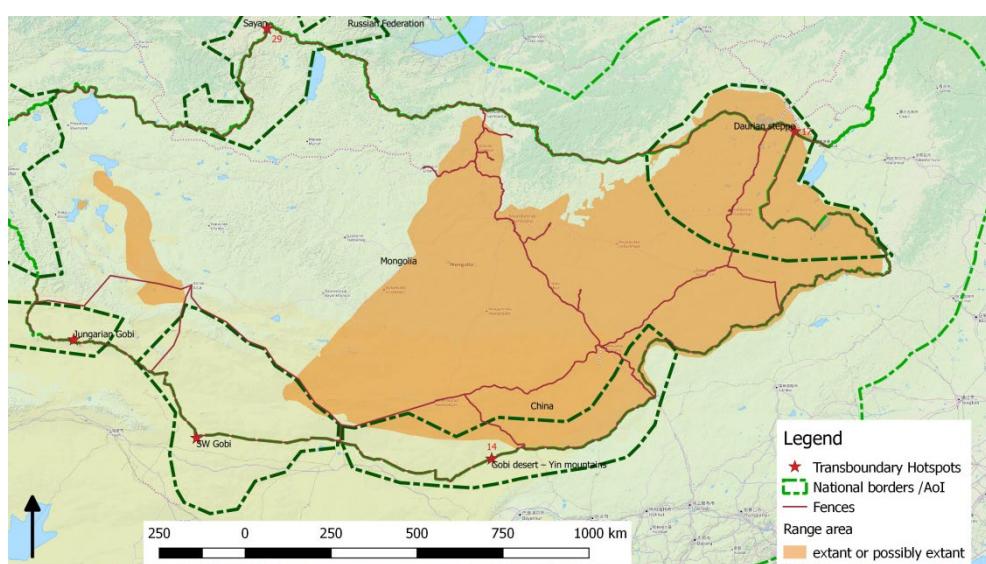
3.13 Mongolian gazelle *Procapra gutturosa*

Status

The IUCN Red List (IUCN SSC Antelope SG, 2016) assessed the status of Mongolian gazelle as LC with a stable population trend. However, population fluctuations due to disease and effects of severe winter conditions are common. Estimates varied between 400,000 and 2.7 million individuals. The main population in Mongolia has been estimated with 0.5 to 1.5 million in the early 2000s, though some experts still believe this figure is too high (IUCN SSC Antelope SG, 2016). Threats are poaching, habitat loss due to expansion of livestock and arable farming and barriers to migration, which fragment habitats and block access to critical forage during times of severe weather conditions. Severe winters can cause heavy mortality. Also disease outbreaks, often associated with transmission from livestock, have caused high losses. The population in China is nationally considered as Critically Endangered.

Range areas

Most of the current population is found in the eastern Mongolian steppes. Smaller populations are found in central and western Mongolia. Some move south into China in winter, but border fences may effectively prevent these migrations. The map provided in The IUCN Red List suggests the existence of range areas in China in the Northeast and Southeast of the species' distribution range.



Range map of Mongolian gazelle within the AoI

Range States

- China, Mongolia, Russia (extant)

Conservation significance of transboundary populations, migrations and movements

The majority of the distribution range of Mongolian gazelle is located within Mongolia. Its fragmentation by fences along railways and roads probably has a higher impact on the species than fragmentation of habitat by border fences. However, the border fences can become problematic for local herds if they prevent access to critical habitats when needed due to severe weather conditions or other factors. As this species occurs in large herds roaming vast areas any fragmentation and blockade of migration routes can cause substantial and permanent population declines.

Proposed TA of significance for the species

ID No.	14	Working Name	Gobi desert – Yin mountains
Countries	China, Mongolia		
Geographic location	To be defined! Possibly several separate sections.		
Coordinates	N 42.163084°, E 106.423024°		

ID No.	17	Working Name	Daurian steppe
Countries	China, Mongolia, Russia		
Geographic location	To be defined!		
Coordinates	N 49.844536°, E 116.703908		

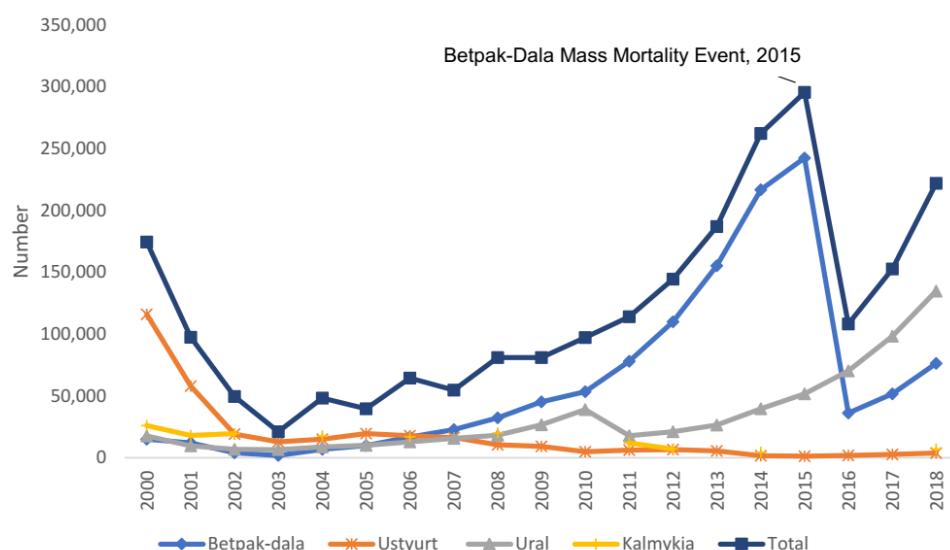
3.14 Saiga antelope *Saiga tatarica*

Status

The IUCN Red List (IUCN SSC Antelope SG, 2018) assessed the status of saiga as CR with a decreasing trend of population size. However, the Saiga currently does not meet the Red List Criteria thresholds for Critically Endangered, but the previous assessment of CR A2acd was retained in the recent assessment because this reassessment fell under the IUCN's five year rule. The Saiga is considered to have crossed the thresholds between CR and EN around 2015; therefore its status will be re-evaluated again in 2020. Saiga currently meets the thresholds for Endangered under criterion A4 based on observed, estimated and projected declines of >50% over 11 years (three generations) due to the risk of mass mortality events resulting from outbreaks of disease or severe weather conditions. The most recent mass mortality event occurred in the Mongolian population in early 2017, caused by PPR, and killed an estimated 54% of this population. (IUCN SSC Antelope SG, 2018)

Saiga antelopes are also subject to strong subsistence and commercial poaching pressure. Locally barriers to migration and habitat degradation together with mortality caused by severe weather events are additional threats.

Despite these threats the global population of saiga is recovering. During the Technical Workshop in April 2019 experts compiled the total figure of 228,000 saigas for 2018 (CMS/CITES, 2019). This figure equals 171,000 mature individuals (ratio of 75% used by the IUCN SSC Antelope SG (2018)). Surveys in April 2019 in all three range areas in Kazakhstan yielded an estimate of totally 334,400 saigas in Kazakhstan only (ACBK Facebook post, 2019).



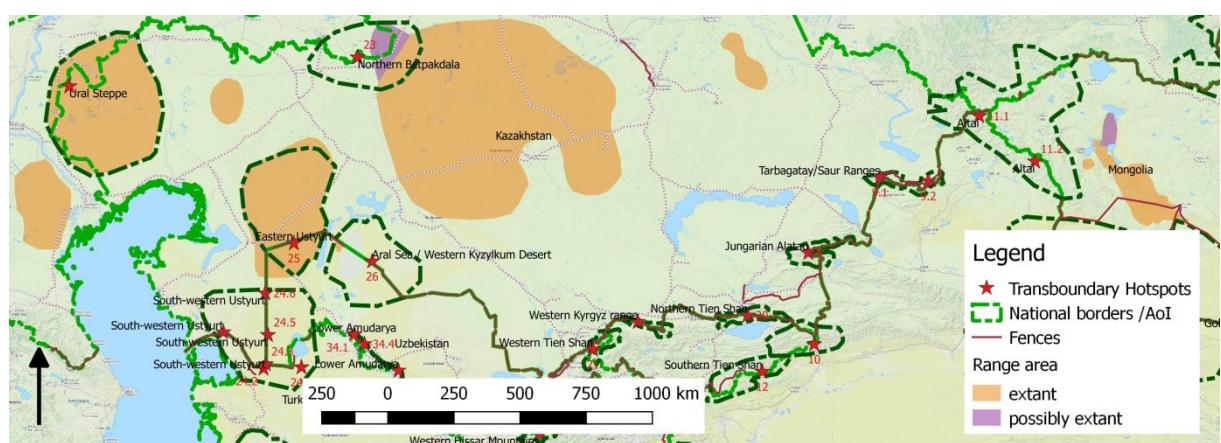
Estimated population sizes for *Saiga tatarica tatarica*, 2006-2018. Data supplied by Saiga Conservation Alliance (IUCN/TRAFFIC, 2019)

Range areas

The distribution range of *Saiga tatarica tatarica* is traditionally divided in four populations (Kalmykia or Northwestern Pre-Caspian, Ural, Ustyurt and Betpkadala), which also are considered as management units and used for the presentation of disaggregated monitoring figures in national and international contexts. The Mongolian saiga *Saiga tatarica mongolica* occurred in one range area, divided into two sections. This picture is presented in The IUCN Red List (IUCN SSC Antelope SG, 2018).

The review of the saiga range areas in the frame of the preparation of the CAMI Atlas revealed a change in the spatial patterns of the distribution range. The range area of the Ural and Ustyurt populations shrank, but in their former ranges two new smaller range areas are now recognized. Also the range area of the Betpakdala population is now smaller than previously indicated, and stretches far less to the south. On the other hand another isolated range area in eastern-central Kazakhstan is now recognized. Furthermore, there are two small areas with saiga antelope at the south (former Island Vozrozhdeniya) and east (wider area of former Island Barsa-Kelmes) of the Aral Sea, both originating from introduced animals. Related saiga observations in the west of Kyzylkum desert in Uzbekistan have been reported by Gritsyna et al. (2016).

In Mongolia the distribution range of saiga expanded, formerly disjunct range areas are now connected and previously abandoned range areas became recolonized. Mass mortality since 2016 (from PPR) and recent winter losses may have caused again a reduction and fragmentation of the current range areas.



Range map of saiga within the AoI

Range States

- Mongolia, Kazakhstan, Russia, Uzbekistan (extant)
- China, Turkmenistan (extinct)

Conservation significance of transboundary populations, migrations and movements

Until the recent past the Ustyurt population had been transboundary and carried out regular seasonal migrations between Kazakhstan and Uzbekistan. Most summer ranges and lambing sites had been in Kazakhstan, although also in Uzbekistan near the border lambing sites were known. The Uzbekistan part of the Ustyurt had mainly been winter range and in some winters saiga herds also reached Turkmenistan. Since the construction of the border fence between Kazakhstan and Uzbekistan (2011-2012) and the railway Shalkar-Beyneu crossing the saiga range in Kazakhstan (finished in 2015), and the massive decline of the population size until 2015 seasonal transboundary migration is virtually lacking. Reportedly (Zuther, pers. comm. 2019) saiga in the Ustyurt in contrast to past reports and observations from other areas are not crossing the railway, possibly due to extreme wariness as a result of intensive poaching and overall low numbers not reaching the "critical mass" to cross an obstacle like the railway. Without this transboundary seasonal migration a high risk of increased mortality in severe winters exists. Also the recovery and survival of the population in Uzbekistan, trapped in its southern range area without access to optimal summer pasture, might be jeopardized. The restoration of the transboundary migrations through effective protection from poaching in both countries and the further mitigation of the barriers (railway

and border fence) will be of high importance for securing the long-term conservation of the Ustyurt population.

The second population of transboundary character is the Ural population. Most of its range area is located in Kazakhstan, but larger groups of up to several thousand saigas regularly move between there and Russia (Saratov, Astrakhan and Volgograd Provinces). The maintenance of migration opportunities and the resulting effective expansion of this transboundary range area are of high importance for the continuing recovery of the Ural population.

The Betpakdala population is not transboundary in the strong sense, although regularly saiga groups have been observed in Russia's Orenburg Province, near the border with Kazakhstan. A border fence, built in critical areas, there seems to prevent transboundary movements almost entirely. So far the areas in Russia have not been considered as significant range areas of the Betpakdala population. However, their importance may increase: first, mass mortality events, which – as experienced in 2015 – can cause population size reductions by as much as 85% (Kock and Robinson, 2018) are more likely to be survived by at least parts of the population if it is spread over larger areas where the chance is higher that some groups remain unaffected, and second, Climate Change may in the future lead to a northward shift of the range area. The mitigation of the border fence may facilitate the expansion of the Betpakdala population and the establishment of subpopulations of transboundary character.

Proposed TA of significance for the species

ID No.	22	Working Name	Ural Steppe
Countries	Kazakhstan, Russia		
Geographic location	Range area of Ural population of saiga		
Coordinates	N 49.860873°, E 47.331539°		

ID No.	23	Working Name	Northern Betpakdala
Countries	Kazakhstan, Russia		
Geographic location	Northern edges of range area of Betpakdala population of saiga, southern Orenburg province		
Coordinates	N 50.673074°, E 60.027631°		

ID No.	25	Working Name	Eastern Ustyurt
Countries	Kazakhstan, Uzbekistan		
Geographic location	Ustyurt east of Atyrau-Nukus road; Saygachiysky reserve		
Coordinates	N 45.207123°, E 57.217359°		

ID No.	26	Working Name	Aral Sea / Western Kyzylkum Desert
Countries	Kazakhstan, Uzbekistan		
Geographic location	E Aral Sea with Barsa-Kelmes SPA/BR		
Coordinates	N 44.642783°, E 60.664708°		

Overview of Range States of species and transboundary populations (Colored cells - species in range states; bold font – confirmed transboundary populations; not bold fonts – transboundary population likely; in brackets – populations possibly or potentially after removal of barriers transboundary, question mark – population possibly extinct; italics – species not yet included in CAMI)

	AFG	CHN	IRN	KAZ	KGZ	MNG	RUS	TJK	TKM	UZB
AFG	(ACJU?) CEHA GABE GASU OVAM PAUN PAPA OVVI	OVAM PAUN	(ACJU) GABE GASU (PAPA)					CEHA OVAM PAPA? PAUN OVVI	(ACJU?) CEHA (EQHE) (PAPA) (OVVI)	CEHA
CHN		(CAFE) (EQFE) GASU OVAM PAUN		(OVAM) PAUN	OVAM PAUN	(CAFE) (EQFE) (EQHE) (GASU) OVAM PAUN (PRGU)	PAUN	OVAM PAUN		
IRN			ACJU EQHE GABE GASU PAPA OVVI						(ACJU) (EQHE) (GASU) PAPA (OVVI)	
KAZ				CEHA EQHE GASU OVAM SATA PAUN PAPA OVVI	OVAM PAUN		OVAM SATA PAUN		(EQHE) (GASU) (SATA) PAPA OVVI	GASU SATA PAUN
KGZ					GASU? OVAM PAUN			GASU? OVAM PAUN		OVAM PAUN
MNG						CAFE EQFE	OVAM PRGU			

						EQHE GASU OVAM PRGU SATA PAUN	PAUN			
RUS						OVAM SATA PAUN <i>PAPA</i>				
TJK							CEHA GASU OVAM PAUN <i>PAPA?</i> <i>OVVI</i>		OVAM PAUN <i>PAPA?</i> <i>OVVI</i>	
TKM								CEHA EQHE GASU SATA? <i>OVVI</i>	EQHE GASU SATA <i>OVVI</i>	
UZB									CEHA EQHE GASU OVAM SATA PAUN <i>PAPA?</i> <i>OVVI</i>	

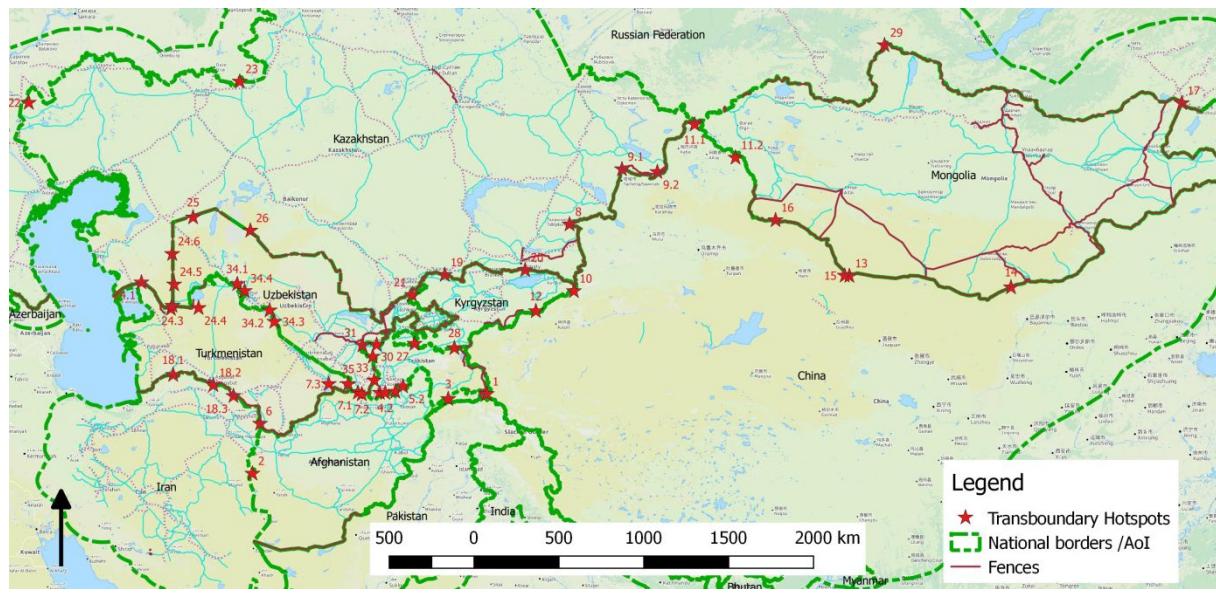
4. List of potential trans-boundary conservation hotspots

4.1 List of potential sites

ID	Countries	Working name	Geographic area	Species
1	AFG-CHN-TJK	High Pamirs	South-eastern Tajik Pamirs, Great and Little Pamir, Sarikol Pamir (Tashkorgan)	OVAM PAUN
2	AFG-IRN		Entire border area	GABE GASU OVI PAPA ACJU(?)
3	AFG-TJK	Wakhan	Wakhan corridor and upper Panj from downstream of Eshkashem up to Sarhad-e Baroghil (AFG) and Tupkhana valley(TJK)	OVI PAUN
4	AFG-TJK	Panj River valley-Tigrovaya Balka	Area between the Vaksh and Panj Rivers, including Tigrovaya Balka SPA	CEHA
5	AFG-TJK	Panj River valley	Panj River valley in the districts Yangi Qaleh (AFG), Farkhor, Hamadoni and Shamsidin Shohin (TJK)	CEHA
6	AFG-IRN-TKM	Badghyz	Hills between Badghyz province (AFG) and Mary (TKM)	EQHE? GASU OVI PAPA
7	AFG-TKM-UZB	Aral Paygambar	Riparian areas near Termez, incl. former Aral Paygambar SPA, closed in the 1990s and upstream of "friendship" bridge	CEHA PAPA
8	CHN-KAZ	Jungarian Alatau	Jungarian Alatau, entire mountain area	OVAM PAUN
9	CHN-KAZ	Tarbagatay/Saur Ranges	Continuous area along the CHN-KAZ border	OVAM PAUN
10	CHN-KAZ-KGZ	Khan Tengri region	Khan Tengri massif in the Tian Shan, incl. Khan Tengri NP in KGZ	OVAM PAUN
11	CHN-KAZ-MNG-RUS	Altai	N-Central part and SE part of Altai mountains	OVAM PAUN
12	CHN-KGZ	Southern Tien Shan	Entire mountain range along border with CHN	OVAM PAUN
14	CHN-MNG	Gobi desert – Yin mountains	To be defined! Possibly several separate sections.	GASU EQHE OVAM PRGU
15	CHN-MNG	SW Gobi	Gobi-Altai - Xinjiang	CAFE EQHE GASU OVAM PAUN
16	(CHN)-MNG	Jungarian Gobi	Great Gobi B SPA Khovd-Xinjiang	EQFE EQHE GASU OVAM PAUN
17	CHN-MNG-RUS	Daurian steppe	To be defined!	PRGU

18	IRN-TKM	Kopet Dagh	Entire mountain range	GASU OVVI PAPA ACJU(?)
19	KAZ-KGZ	Western Kyrgyz range	Kyrgyz range in Jambyl province (KAZ) and Talas province (KGZ)	OVAM PAUN
20	KAZ-KGZ	Northern Tien Shan	Zaili-Alatoo and Kungey-Alatoo	OVAM PAUN
21	KAZ-KGZ-UZB	Western Tien Shan	Ugam-Chatkal NP, Chatkal SPA, Aksu-Zhabagly SPA, Besh Aral SPA	PAUN OVAM?
22	KAZ-RUS	Ural Steppe	Range area of Ural population of saiga	SATA
23	KAZ-RUS	Northern Betpakdala	Northern edges of range area of Betpakdala population of saiga, southern Orenburg province	SATA
24	KAZ-TKM-UZB	South-western Ustyurt	Ustyurt SPA and areas south of it; Kaplankyr Plateau, se of shor (TKM), chink = border between KAZ-TKM, UZB-TKM; Kazakhly shor; Kaplankyr SPA south of Sarygamysh lake; areas south of the road Barsa Kelmes – Jaslyk	EQHE GASU PAPA OVVI
25	KAZ-UZB	Eastern Ustyurt	Ustyurt east of Atyrau-Nukus road, Saygachiy reserve	GASU SATA
26	KAZ-UZB	Aral Sea / Western Kyzylkum Desert	E Aral Sea with Barsa-Kelmes SPA/BR	GASU EQHE SATA
27	KGZ-TJK	Eastern Turkestan Range	Hissaro-Alai system (eastern Turkestan range)	OVAM PAUN
28	KGZ-TJK-UZB	Pamir-Alai	Transalai and Alai ranges, Alai valley	OVAM PAUN
29	MNG-RUS	Sayan	Tuva/Irkutsk prov./Buryatiya - Khovsgol	(OVAM) PAUN
30	TJK-UZB	Western Hissar Mountains	Western section of the Hissaro-Alai mountain range	PAUN
31	TJK-UZB	Zerafshan river valley	Zarafshon Reserve and Zarafshon NP	CEHA
32	TJK-UZB	Western Turkestan Range	Turkestan Range west of Shahristan	OVAM PAUN?
33	TJK-UZB	Babatag	Babatag Mountains along the border	OVVI, PAPA? GASU in lower areas?
34	TKM-UZB	Lower Amudarya	Amudarya s of "Kungrad"/Imeni Telmana; incl. Nazarkhan core zone (Uzbekistan) Amudarya near Lebap between Khorezm and Kyzylkum SPA, Amudarya SPA and Kyzylkum SPA	CEHA
35	TKM-UZB	Kugitang/ Koytendag	Surkhan SPA and Koytendag SPA	OVVI PAPA?

Note: ID 13 is left out because it had been assigned to an area included in another site.



4.2. Characteristics of sites

Site ID: 1

Name: High Pamirs

Countries: AFG-CHN-TJK

Location:

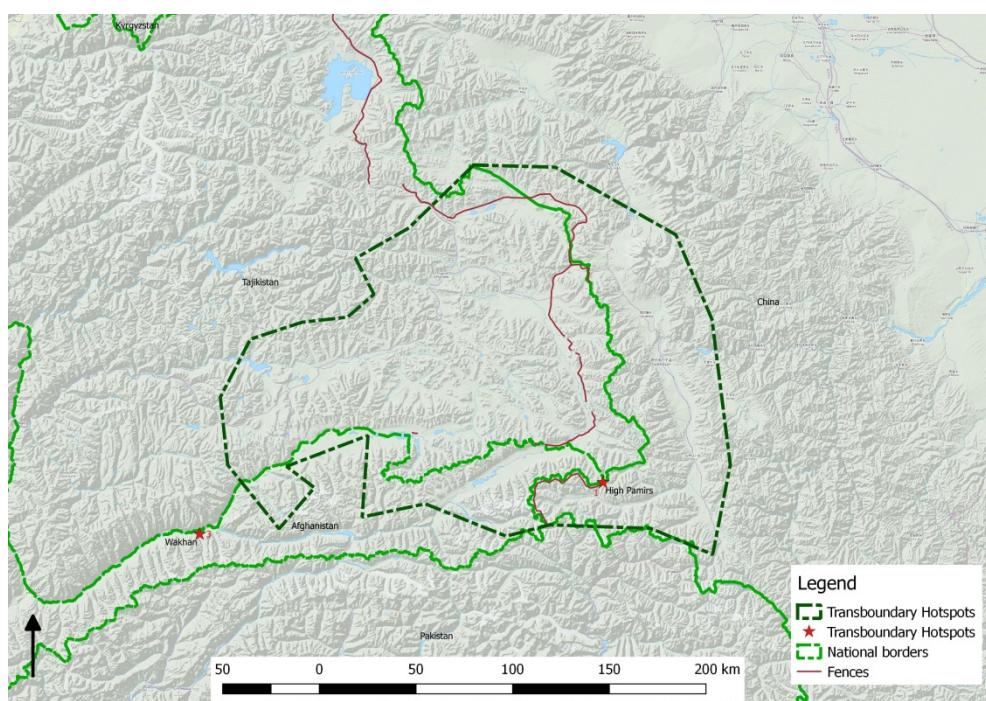
Administrative,

- Afghanistan, Badakhshan Province, Wakhan district;
- China, Xinjiang Province, Tashkorgan;
- Tajikistan, Gorno-Badakhshan Autonomous Region, Murghab District

Geographic area:

- Great and Little Pamir (AFG);
- Sarikol Pamir (CHN)
- South-eastern Pamirs, inkl. Great Pamir (TJK)

Coordinates: N 37.225377°, E 74.889355°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir Tien-Shan Highlands;

WWF Ecoregion (Olson et al., 2001): Pamir alpine desert and tundra;

High mountains, high mountain desert, high mountain grasslands, wetlands, glaciers

Species:

Argali:

Population size: 15,000 (expert guess, depending on the boundaries of the site);

Movements: in some locations regular seasonal movements, vertical movements, locally more or less sedentary, males more mobile than females, transboundary movements: regularly AFG-TJK, irregularly AFG/TJK-CHN;

Importance of transboundary population: Share of animals carrying out regular transboundary movements out of the total population not known. Genetic research (Luikart et al., 2011) and DNA-based population study (Harris et al., 2010) suggest that the population in Afghanistan is well connected with the population in Tajikistan, but less with the population

in China. Connectivity is important for the entire population, mostly for the comparably small population in Afghanistan.

Snow leopard:

Population size: unknown, range of 30 - 150 (own guess);

Movements: Given typical home range sizes and known distances of dispersal, regular transboundary movements can be expected. Males are more mobile than females.

Importance of transboundary population: The population should be considered as transboundary. Connectivity in this area as major link between more northern and more southern range area is likely important for the long-term conservation of the global population of the species.

Conservation significance:

The area is of high significance for the conservation of the two target species as well as for a number of other high-mountain species and for its ecosystem values and functions. It includes one of the major sources of the rivers Panj and Amu Darya. The Site covers substantial parts of the GSLEP Landscape "Pamir".

Protected areas status:

Afghanistan: Wakhan National Park (covering all of Afghanistan's part of the area)

China: Tashkorgan Nature Reserve (covering parts of China's part of the area)

Tajikistan: Zorkul Strictly Protected Area (covering parts of Tajikistan's part of the area). Other important parts are included in private hunting concessions (namely the concession of LLC "Murgab" and of associated companies and the community-based conservation area of NGO "Burgut" – depending on the boundaries of the site).

Barriers for migration:

Border fences are barriers for argali:

- AFG-CHN – from CHN side;
- AFG-TJK – only small section old Soviet fence from TJK side, partly destroyed, still source of mortality, Ali, pers. comm. 2012);
- CHN-TJK – partly new fence from CHN side (?), old Soviet fence from TJK side, locally open or broken, still substantial barrier and source of mortality.

Other threats:

Argali:

- Poaching, partly transboundary between AFG and TJK and associated disturbance;
- Livestock (reduction of available habitat caused by human and herders dogs presence, forage competition, disease transmission, habitat degradation) especially in AFG and CHN;
- Mining in area handed over from TJK to CHN.

Snow leopard:

- Low density or decline of wild ungulate prey (mainly AFG, less TJK, CHN?);
- Killing in human-wildlife conflict;
- Poaching for illegal trade (?) and for illegal trophy hunting (?).

Existing or planned transboundary activities:

- ICIMOD initiative for landscape level conservation

Recommendations for action:

- Removal of dysfunctional border fence TJK-AFG and TJK-CHN:

- Would be technically easy to implement, but full removal potentially expensive and risk of dangerous remnants being left (barbed wire);
 - No obvious barriers except readiness of TJK border police;
 - Along some areas at the TJK-CHN border this old fence may also create an area with less intensive human impact (poaching, livestock), but this might not be any longer the case as the fence is not maintained and protected.
- New fence CHN-TJK and CHN-AFG (?): Limitation of length of new construction and mitigation of existing fence would be important to increase connectivity for argali. Feasibility of mitigation and existing barriers (political will in CHN) remain unclear.
- "Belt and Road Initiative": Assessment of potential impact and political intervention for avoidance, mitigation and compensation of impact.
- Transboundary coordinated monitoring of argali and snow leopard: Coordinated argali surveys between all three countries. Difficult access of AFG Pamirs makes synchronous surveys difficult to implement. So far coordination between all three countries is lacking. Snow leopard – information exchange and in areas with likely movements comparison of camera trap pictures and/or coordinated non-invasive DNA sampling.
- Transboundary information exchange: Collaboration between the protected areas would be meaningful. Barriers – language, unclear if PA administrations are allowed to have direct transboundary collaboration.

Site ID: 2

Name: T.b.d.

Countries: AFG-IRN

Location:

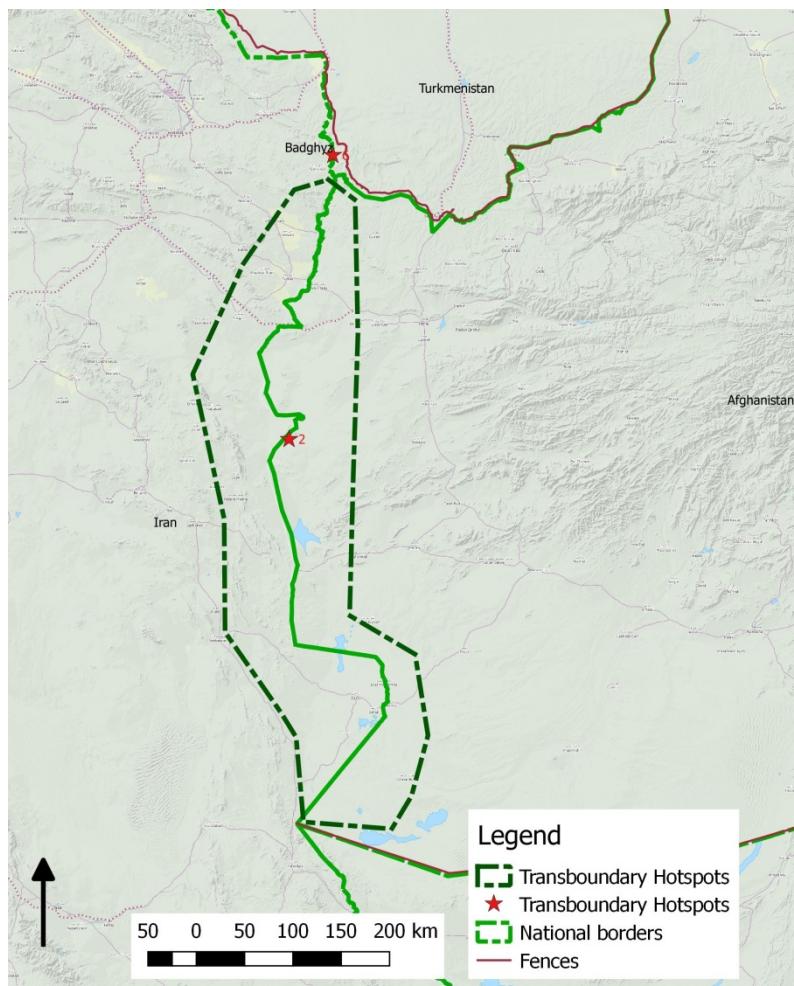
Administrative,

- Afghanistan, Provinces Herat, Farah and Nimroz;
- Iran, Provinces Khorasan-e Razavi, Khorasan-e Jonubi, Sistan va Baluchistan

Geographic area:

- Entire border area

Coordinates: N 33.320370°, E 60.789269°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Anatolian-Iranian Desert, Iranian Desert, Edge of Hindu Kush Highlands; WWF Ecoregion (Olson et al., 2001): Central Persian desert basins, Registan-North Pakistan sandy desert, Central Afghan Mountains xeric woodlands, Kuh Rud and Eastern Iran montane woodlands, Badghyz and Karabil semi-desert; Medium mountains, semi-desert, desert (hills, loess, sand), wetlands, seasonal lakes

Species:

Asiatic cheetah:

Population size: unknown, possibly extinct in the area, current range maps do not indicate the area, but Manati and Nogge (2008) suggest that few cheetahs might have survived in the north-western part of Afghanistan;

Movements: unknown;

Importance of transboundary population: Given the critical status of the subspecies any individuals would be of conservation significance. If any cheetahs occur in the area, this would be likely dispersing males.

Chinkara:

Population size: unknown; The Iranian DoE in 2009 reported 164 chinkara in Sistan va Baluchistan.

Movements: The most southern section of the border region is included in the range area of chinkara in The IUCN Red List and the CAMI Atlas. The Atlas of the Mammals of Iran (Karami et al., 2012) indicates one occurrence at the border with Afghanistan in northern Sistan va Baluchistan province. No information is available about the specific location, the area of occupancy and the movements.

Importance of transboundary population: The size of any potential transboundary population is unknown. The area covers only minor section of the overall range area of the species, but might be important for the connectivity of any population of the species in southern Afghanistan.

Goitered gazelle:

Population size: unknown; The Iranian DoE in 2009 reported 497 animals in Khorasan-e Razavi and 3453 Khorazan-e Jonubi.

Movements: Range areas indicated in the CAMI Atlas are restricted to the Afghanistan side of the border in its full length, but at the Iranian side closest indicated range areas are 200 km and farer away from the border. In The IUCN Red List the range areas is entirely transboundary. Karimi et al. (2012) show occurrence of goitered gazelle close to the border with Afghanistan in Khorasan-e Razavi and in the north of Khorazan-e Jonubi provinces, but not in Sistan va Baluchistan. No information is available about the specific occurrence in the area and the movements.

Importance of transboundary population: The size of any potential transboundary population is unknown. Given the fragmentation of most parts of the species' range area and generally low numbers, a transboundary population in this area might be of regional or at least national significance for the two countries.

Urial:

Population size: unknown; The Iranian DoE in 2009 and 2016 reported 7193/7269 urial in Khorasan-e Razavi, 787/2285 in Khorazan-e Jonubi and 132/152 in Sistan va Baluchistan.

Movements: Range areas indicated in The IUCN Red List and in Karimi et al. (2012) indicate occurrence in all three border provinces, but not immediately in areas close to the border. For Afghanistan no information is available about urial in the respective provinces. Potentially suitable areas are locally transboundary, but at the Afghan side likely not connected to larger suitable habitat. Only in the north of Herat province (AFG) bordering Khorasan-e Razavi (IRN) relief conditions suggest a potential habitat connection with other urial range areas in Afghanistan. No transboundary movements are known.

Importance of transboundary population: The size of any potential transboundary population is unknown. Compared to other not transboundary populations the conservation significance of any potential transboundary population is likely low.

Persian leopard:

Population size: unknown;

Movements: In The IUCN Red List the northern most part of the border is indicated as extant in Iran and possibly extant in Afghanistan. Range areas indicated in The Atlas of Mammals of Iran are close to the border in Khorasan-e Razavi and the north of Khorazan-e Jonubi. No information is available about the actual occurrence in the area and the movements.

Importance of transboundary population: The size of any potential transboundary population is unknown. Given the fragmentation of most parts of the species' range area and generally low numbers, a transboundary population in this area might be of global or at least regional

significance. It would be a connecting element between the Persian leopard's main range area in Iran and southern Turkmenistan and the evident population (Moheb and Bradfield, 2014) in the Northern Plateau in Yakawlang district of Afghanistan's Bamyan province.

Conservation significance:

Little is known about the area, which might be of high significance for the conservation of Persian leopard, and of regional significance for the other target species.

Protected areas status:

In Iran Shileh Protected Area of 6,525 ha (NE edge: N 30.400000°, E 61.127778°) is located in this site, about 20 km east of the border. Chinkara may occur there. (Darvishsefat, 2006) No protected areas exist in the area in Afghanistan.

Barriers for migration:

The area does not seem to have border fences. The diverse natural relief might present local barriers to migration – flat desert for urial and leopard, mountains for the gazelles – as well as areas with human settlements for all target species.

Other threats:

No area-specific information is available on threats. All four species are targets of poachers and poaching is likely the most important threat for them in the area. Leopard is frequently involved in human-wildlife conflict, but no specific information is available from this area.

Recommendations for action:

The area would deserve being more intensively studied for identifying sections of particular high conservation significance and determining the feasibility of conservation action. For urial and leopard the potentially most important areas are in the north of the common border (Herat and Khorasan-e Razavi, for chinkara in the south (Nimroz and Khorasan-e Jonubi) and for goitered gazelle in the mid-north (Herat and Farah and Khorasan-e Razavi and Khorasan-e Jonubi).

Site ID: 3

Name: Wakhan

Countries: AFG-TJK

Location:

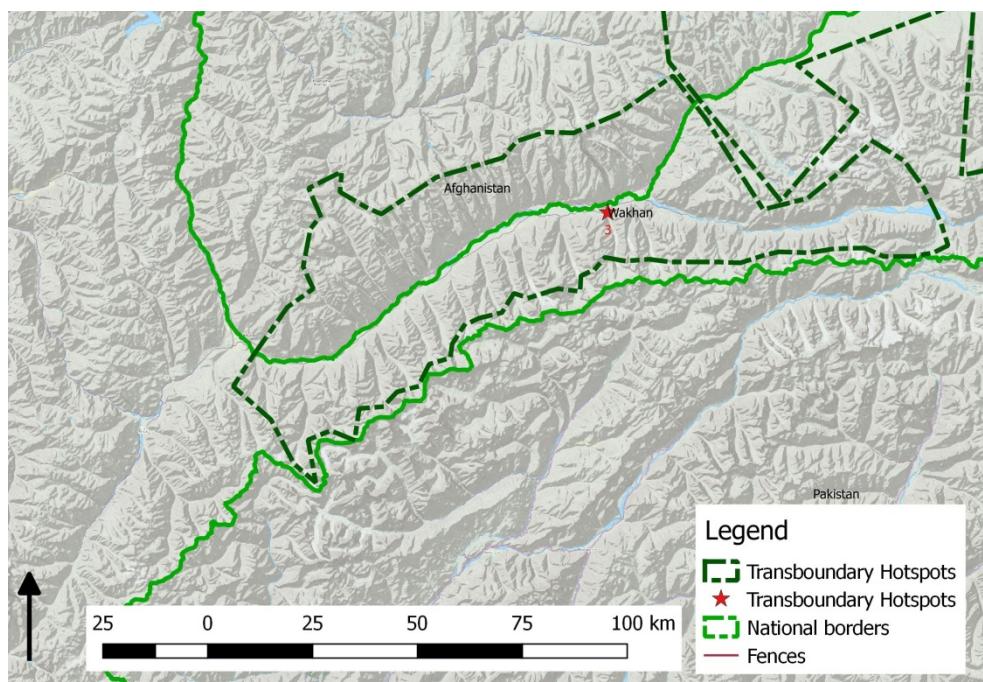
Administrative,

- Afghanistan, Badakhshan Province, Wakhan district;
- Tajikistan, Gorno-Badakhshan Autonomous Region, Ishkashim District

Geographic area:

- Wakhan upstream from Ishkashim to Sarhad-e Baroghil (AFG) and Tupkhona valley (TJK)

Coordinates: N 36.988622°, E 72.568698°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir Tien-Shan Highlands;

WWF Ecoregion (Olson et al., 2001): Karakoram-West Tibetan Plateau alpine steppe, Gissaro-Alai open woodlands;

High mountains, high mountain desert, high mountain grasslands, riparian areas, glaciers

Species:

Urial:

Population size: approx. 400 in AFG (survey WCS, 2010), irregularly in TJK, there permanent population likely extirpated;

Movements: poorly understood; according to local people in some locations regular seasonal movements, vertical movements, locally more or less sedentary, transboundary movements: irregularly AFG-TJK;

Importance of transboundary population: Currently population is effectively not transboundary and comparably well preserved in Afghanistan. Recolonization or reintroduction in TJK would be important for restoration of range area and numbers and serve as backup population. Genetic exchange would be likely at least by males.

Snow leopard:

Population size: unknown, range of 30 - 50 (own guess);

Movements: Given typical home range sizes and known distances of dispersal, regular transboundary movements can be expected. Males are more mobile than females. Movement of collared animal from AFG to TJK and back has been documented by WCS.

Importance of transboundary population: The population should be considered as transboundary. Despite the river as partly barrier, this area is part of the major link between more northern and more southern range area, which is likely important for the long-term conservation of global population of the species.

Conservation significance:

The area is of high significance for the conservation of the two target species as well as for a number of other high-mountain species and for its ecosystem values and functions. The Site covers parts of the GSLEP Landscape “Pamir”.

Protected areas status:

Afghanistan: Wakhan National Park (covering all of Afghanistan’s part of the area)

Tajikistan: No state protected area;

Two sections – Darshaydara gorge and sections between Zong and Tupkhona are protected as conservancies by the community-based wildlife conservation NGOs “Yoquti Darshay” and “Yuz-Palang”.

Barriers for migration:

No border fence. The Panj River acts locally as natural barrier, but can be easily crossed by the target species at most sections.

Other threats:

Urial:

- Livestock (forage competition, disease transmission, habitat degradation);
- Conflict with farmers caused by grazing in wheat and barley fields;
- Potentially poaching, but currently likely very limited (AFG), opportunistic poaching on urials moving to TJK may prevent recolonization.

Snow leopard:

- Low density or decline of wild ungulate prey (mainly TJK);
- Killing in human-wildlife conflict;
- Poaching for illegal trade(?)

Existing or planned transboundary activities:

- ICIMOD initiative for landscape level conservation

Recommendations for action:

- **Belt and Road Initiative:** Assessment of potential impact and political intervention for avoidance, mitigation and compensation of impact.
- **Community-based conservation:** Support models and collaboration between communities in Tajik Wakhan and those living in Wakhan National Park.
- **Transboundary coordinated monitoring of urial and snow leopard:** Currently permanent urial presence in TJK is unlikely, but some level of coordination might be useful, in particular where areas in AFG can be easily observed from TJK; snow leopard – information exchange and in areas with likely movements comparison of camera trap pictures and/or coordinated non-invasive DNA sampling.
- **Transboundary information exchange:** Particularly important might be direct exchange between local wildlife conservation NGOs and other conservation actors across the borders. A barrier is the visa and border regime, which makes visits difficult to arrange and expensive (AFG-TJK) or impossible (AFG-CHN) or would require long detours (TJK-CHN).

- Reintroduction or supported recolonization of urial in TJK: Technical feasibility of reintroduction is likely in terms of sufficiently large source population for taking the necessary number of founder animals and habitat suitability in Tajikistan. Recolonization is rather unlikely as in most areas the Panj River valley forms a broad strip of unsuitable habitat, which is unlikely to be crossed by a sufficiently large numbers of colonizers.

Site ID: 4

Name: Panj River valley-Tigrovaya Balka Countries: AFG-TJK

Location:

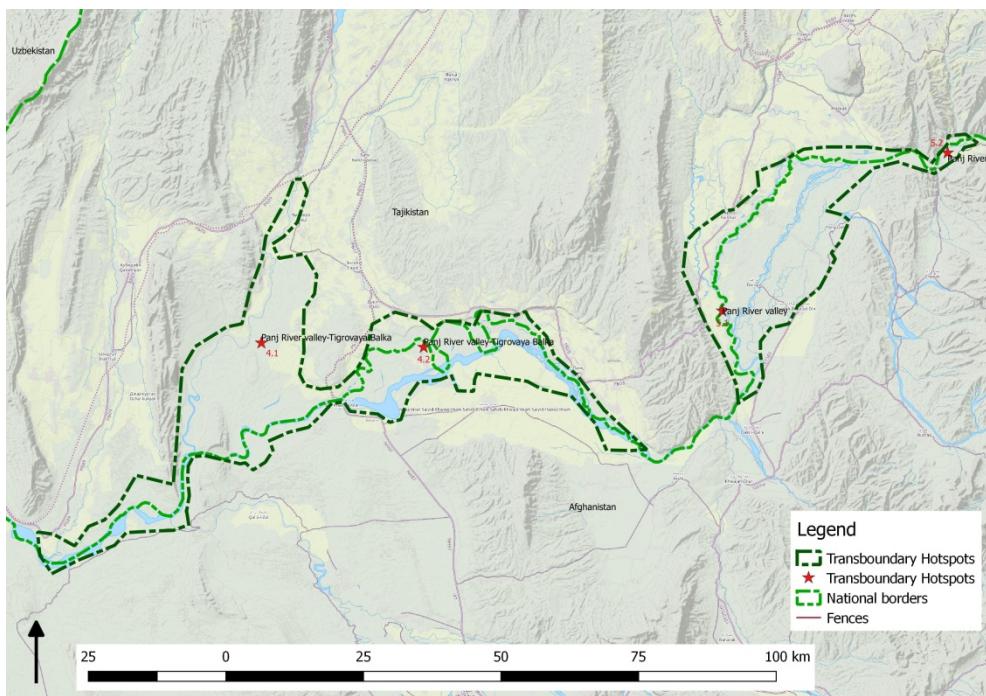
Administrative,

- Afghanistan, Balkh Province, Kaldar and Khulm districts, Kunduz Province, Qala-e Zal and Imam Sahib districts;
- Tajikistan, Khatlon Region, districts Chilikul, Qabodiyon and Qumsangir

Geographic area:

- Panj River valley (AFG and TJK), area between the Vaksh and Panj Rivers, including Tigrovaya Balka SPA (TJK);
- Remark: The range area of CEHA in this area as indicated in the CAMI Atlas seems to be larger than the suitable habitat visible in satellite imagery (Bing Aerial, Google Earth).

Coordinates: N 37.286642°, E 68.450740°; N 37.279697°, E 68.780875



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Hindukush and Pamir Tien-Shan Highlands;

WWF Ecoregion (Olson et al., 2001): Badghyz and Karabil semi-desert, Gissaro-Alai open woodlands;

Riparian forest, riparian woodland, reeds, agricultural lands, semi-desert

Species:

Bukhara deer:

Population size: Tajikistan: Tigrovaya Balka SPA: 270 (or only 130-140), other areas unknown (CMS, 2011b), Afghanistan unknown;

Movements: poorly understood; major population in SPA Tigrovaya Balka probably not regularly moving outside of the PA, possibly males more mobile, transboundary movements: at least irregularly AFG-TJK;

Importance of transboundary population: Currently population is well preserved locally in Tajikistan and likely only a small part is transboundary. Range area expansion along the Panj

River would take place in both countries (national border in the river course) and occurrence further upstream (Site #5) suggests that such movements occur at least irregularly.

Conservation significance:

The area is of high significance for the conservation of Bukhara deer. Its population is the only larger autochthonous population of the subspecies and has been (together with nearby Site #7 Aral Paygambar) the direct or indirect source population for the existing reintroduced as well as semi-wild and captive populations.

Protected areas status:

Tajikistan: Strictly Protected Area “Tigrovaya Balka”.

Barriers for migration:

No border fence. The Panj River itself is not a natural barrier, but there are intensively cultivated and densely populated areas, where human presence hinders migration and causes mortality.

Other threats:

Habitat quality for Bukhara deer in the SPA Tigrovaya Balka is affected by modified flood regime, caused by upstream large reservoirs, in particular, Nurek Reservoir and the newly built Roghun Reservoir, as well as by illegal tree cutting and livestock grazing. The population is fluctuating but seems stable although the limiting factors are poorly understood. Poaching might be a source of mortality, in particular outside of the SPA. There is potential of conflict with farmers caused by grazing in crop fields.

Recommendations for action:

Transboundary coordinated monitoring of Bukhara deer and information exchange: Currently permanent deer presence in AFG is unlikely, but some level of coordination might be useful, in particular where areas in AFG can be easily observed from TJK, they should be included in any monitoring and information be provided to the agency in charge, the National Environmental Protection Agency (NEPA). If any research activities in AFG would take place coordination with TJK (Committee of Environmental Protection) would be needed, e.g. for coordinated surveys and non-invasive DNA sampling.

Barriers: Agricultural land-use severely limits the available habitat for Bukhara deer and its movements. The deer would ecologically be able to use also agricultural lands and poplar plantations, but poaching and conflict may prevent this. The volatile security situation in AFG may hamper transboundary conservation activities in the area.

Site ID: 5

Name: Panj River valley

Countries: AFG-TJK

Location:

Administrative,

- Afghanistan, Kunduz Province, Yangi Qaleh and Darqad districts;
- Tajikistan, Khatlon Province, districts Farkhor, Hamadoni and Shamsidin Shohin

Geographic area:

- Panj River valley (AFG and TJK);
- Remark: The range area of CEHA in this area indicated in the CAMI Atlas seems to be smaller than the suitable habitat visible in satellite imagery (Bing Aerial, Google Earth) and the known occurrence of the species.

Coordinates: N 37.338443°, E 69.388120°; N 37.593436°, E 69.846198°

Map: see Site #4

Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Hindukush and Pamir Tien-Shan Highlands;

WWF Ecoregion (Olson et al., 2001): Paropamisus xeric woodlands, Gissaro-Alai open woodlands;

Riparian forest, riparian woodland, reeds, agricultural lands, semi-desert

Species:

Bukhara deer:

Population size: Tajikistan: Farkhor 20-24, Hamadoni 16-18, Shamsidin Shohin 6-7 (CMS, 2011b), Afghanistan unknown, Darqad district – observed several times from Tajikistan (pers. inform. Ikromov 2008 – 2012) and by WCS in Afghanistan (pers. inform. Paley 2017);

Movements: poorly understood; possibly connection with the population in SPA Tigrovaya Balka, but likely not regular movements between that site and this area, possibly males more mobile, transboundary movements: at least irregularly AFG-TJK;

Importance of transboundary population: Currently this population is very small and only surviving as transboundary population. Movements along the Panj River likely take place in both countries (national border in the river course) and fragmented occurrence of small groups of individuals suggests that such movements occur at least irregularly.

Conservation significance:

The area is of significance for the conservation of Bukhara deer. Its population is part of or connected with the only larger autochthonous population of the subspecies. It provides an opportunity for general population stabilization and range area increase as well as a possible backup in case of disease or other events in the main population in SPA Tigrovaya Balka.

Protected areas status:

Tajikistan: Reserve “Dashtijum”, Strictly Protected Area “Dashtijum” – both bordering suitable habitat but not including it in substantial areas.

Barriers for migration:

No border fence. The Panj River itself is not a natural barrier, but there are intensively cultivated and densely populated areas, where human presence hinders migration and causes mortality.

Other threats:

Fragmented population and fragmented habitat in small patches. Habitat influenced by livestock, expansion of arable farming and (possibly) cutting of trees. Poaching might be the

main source of mortality, in particular outside of the SPA. There is potential of conflict with farmers caused by grazing in crop fields. Changing flow dynamics in the Panj River due to climate change may impact on habitat quality, recruitment and adult mortality.

Recommendations for action:

Transboundary coordinated monitoring of Bukhara deer and information exchange: Currently permanent deer presence in AFG is unlikely, but some level of coordination might be useful, in particular where areas in AFG can be easily observed from TJK, they should be included in any monitoring and information be provided to the agency in charge, the National Environmental Protection Agency (NEPA). If any research activities in AFG would take place coordination with TJK (Committee of Environmental Protection) would be needed, e.g. for coordinated surveys and non-invasive DNA sampling.

Barriers: Agricultural land-use severely limits the available habitat for Bukhara deer and its movements. The deer would ecologically be able to use also agricultural lands and poplar plantations, but poaching and conflict may prevent this. The volatile security situation in AFG may hamper transboundary conservation activities in the area.

Site ID: 6

Name: Badghyz

Countries: AFG-(IRN?)-TKM

Location:

Administrative,

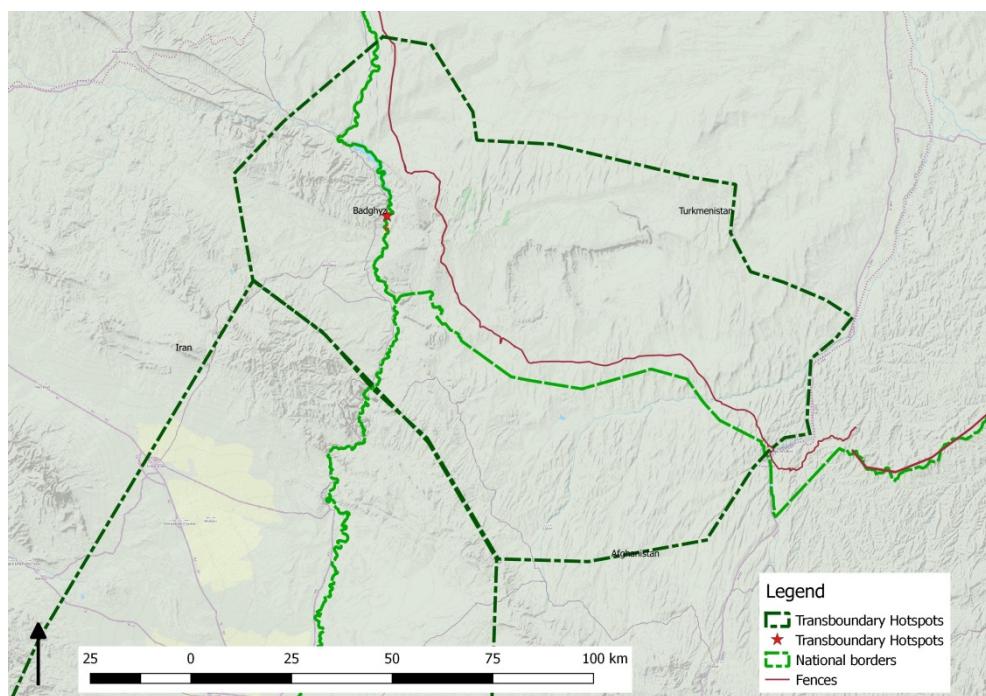
- Afghanistan, Badghyz Province;
- Iran, Khorasan-e Razavi Province
- Turkmenistan, Mary and Akhal Provinces

Remark: The atlas of the Mammals of Iran (Karimi et al., 2012) shows none of the target species in the immediate area, possibly except the Persian leopard. So there is potential for including Iran, Khorasan-e Razavi Province, in this conservation hotspot.

Geographic area:

- Hill areas in the border region with main area in Turkmenistan;

Coordinates: N 35.791905°, E 61.251093°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Hindukush Highlands, Turanian (Kazakh desert scrub-steppe);

WWF Ecoregion (Olson et al., 2001): Badghyz and Karabil semi-desert, Kopet Dag woodlands and forest steppe;

Semi-desert, sparse xerophytic shrubs, pistachio woodland, solonchak, riparian forest, small sections of riparian woodland, reeds and agricultural lands

Species:

Asian wild ass:

Population size:

Afghanistan: No wild ass presence is known, the area is poorly studied, but due to the border fence since running few kilometres inside Turkmenistan territory and reported presence of wild ass in the border zone, occurrence cannot be excluded.

Iran: No reports about permanent population from the site.

Turkmenistan: The population had been fluctuating heavily during the last decades from as low as ~200 in 1942 up to a peak population of ~5,000 in 1993-1996 (Lukarevskiy 1999,

Denzau and Denzau 1999). In 1996, poaching pressure increased dramatically and numbers dropped to 2,400 by 1998 and ~500 by the beginning of the 2000s. Conservation measures started in 2000 and the population grew back to ~850-900 individuals in 2005, but was believed to have dropped again to ~600 animals in 2010 and 420 by 2013 (Kaczensky and Linnell 2015). Kaczensky and Linnell (2015) mention 59 observations in Badkhyz SPA, but were certain having observed several animals repeatedly. The figure of 400+ reported by the SPA staff was certainly not present in the area. Kaczensky (pers. comm. 2018) reported that kulan was likely extirpated around 2016 or very few animals survived confined to the inaccessible, fenced border zone. The latter would be highly unlikely, given that border guards are likely supplying their food by poaching. Since 2017 there were no observations, camera trap records or presence signs (Kaczensky, pers. comm. 2019).

Movements: In the past wild ass moved seasonally between the SPA and adjacent agricultural areas. During the dry season, it is believed that approximately 70% of the Turkmenistan kulan population migrated approximately 50-70 kilometres between the Badkhyz SPA/Gyzyljar Wildlife Sanctuary and the Chemenabat Wildlife Sanctuary in search of drinking areas along the Gushgy River, where there are numerous pools. In Iran previously visiting animals from Turkmenistan at night time at melon fields, ceased since erection of border fence from the Iranian side (Ghoddousi, pers. comm. 2019). However, Kaczensky (pers. comm. 2019) finds this unlikely due to the existence of the border fence from Turkmenistan. So, if these reports are correct they may indicate kulan presence beyond the border fence of Turkmenistan. No further information about transboundary movements is available.

Importance of transboundary population: Currently population is extinct or very small and if at all possibly surviving as transboundary population between the Turkmenistan and Iran border fences. As this had been the last autochthonous population of the subspecies, its conservation would be of high importance, although reintroduced population despite small founder populations and repeated genetic bottlenecks so far did not show any adverse impacts of inbreeding.

Goitered gazelle:

Population size: Turkmenistan 3,700 in 2013 (Kaczensky and Linnell 2015), 400 in 2014-2017 (Rustamov, pers. comm. 2018); Afghanistan and Iran unknown;

Movements: No documented transboundary movements known. Between Iran and Turkmenistan unlikely, due to border fences from both sides of the border. Between Afghanistan and Turkmenistan only fence from Turkmenistan side hindering migration. Between Afghanistan and Iran – unclear situation;

Importance of transboundary population: Population estimate from 2013 for Turkmenistan indicates a significant population, but this either had been an overestimate or the population declined since rapidly. If transboundary movements would not be blocked and other threats would be effectively addressed, the population could become of at least regional importance and facilitate a good conservation status in all three countries, especially under consideration of detected genetic drift in isolated goitered gazelle populations of small individual numbers (Khosravi et al., 2019).

Urial:

Population size: Turkmenistan: 1,600 in 2013 (Kaczensky and Linnell 2015), 500 in 2014-2017 (Rustamov, pers. comm. 2018), Afghanistan and Iran unknown;

Movements: No documented transboundary movements known. Between Iran and Turkmenistan unlikely, due to border fences from both sides of the border. Between Afghanistan and Turkmenistan only fence from Turkmenistan side hindering migration, but habitat only suitable in small sections. Connectivity between Afghanistan and Iran - unclear;

Importance of transboundary population: Population estimate from 2013 for Turkmenistan indicates a significant population, but this either had been an overestimate or the population declined since rapidly. If transboundary movements would not be blocked and other threats would be effectively addressed, the population could become of at least regional importance

and facilitate a good conservation status in Iran and Turkmenistan, but also provide an important connecting link with the range area in Afghanistan.

Persian leopard:

Population size: Unknown. Presence confirmed in Turkmenistan and Iran;

Movements: Transboundary movements likely despite border fence;

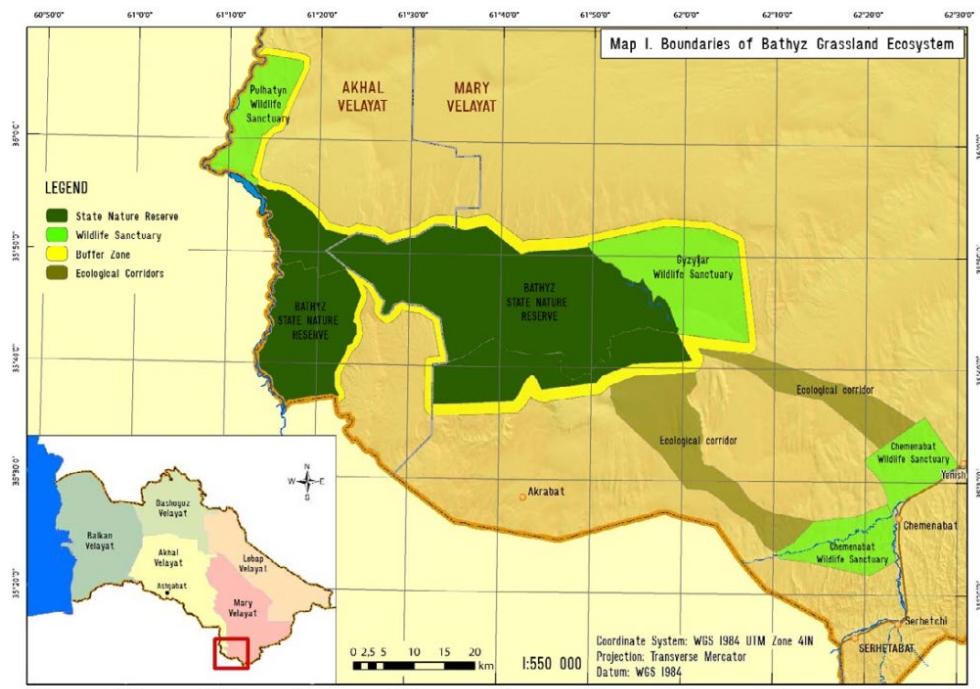
Importance of transboundary population: Given the large home ranges and dispersal movements the leopards of this area are part of a larger population. The area has likely high regional importance for the connectivity of Persian leopards in the eastern part of their range.

Conservation significance:

The area is of significance for the conservation of four target species – Asian wild ass (kulan), goitered gazelle, urial and leopard. The conservation status of at least the first three species is highly unfavourable at the moment with massive declines in the so far best preserved area in Turkmenistan. The area still retains a high potential for a recovery of these species and thus maintains high conservation significance. While the population of Asian wild ass is (or has been) isolated, the other populations are part of or connected with the larger range areas of these species and are thus of importance for their conservation at a regional scale.

Protected areas status:

Turkmenistan: Badkhyz SPA with current size of 87,700 ha. Three reserves (or Wildlife Sanctuaries = zakazniks in Russian) are associated with the SPA: Pulhatyn (15,000 ha) to the NW, Gyzyljar (30,000 ha) to the east and Chemenabat (12,000 ha) to the SE (Kaczensky and Linnell, 2015). Iran: Bagh-e Keshmir protected area (eastern edge: N 35.772222°; E 60.652778°) with 20,299 ha is located in a distance of 46 to 60 km from the border (Darvishsefat, 2006).



Map of Badkhyz SPA (State Nature Reserve) and adjacent zakazniks and corridors (“Sanctuary”), Kaczensky and Linnell, 2015, based on Rustamov et al., 2015.

Barriers for migration:

There is a border fence (chain link, high) along the entire border at the Turkmenistan side, fencing off access to water for large mammals and preventing transboundary movements.

Since the 1960s, this border fence runs parallel with the international borders with Iran to the west and Afghanistan to the south. This fence is located 3 to 5 km inside Turkmen territory meaning that ca. 12,000 ha (14% of the total area) of the current Badkhyz SPA, all of the 29,000 ha of the planned extension of the Badkhyz SPA to the west, and 13,100 ha (87% of the total area) of the Pulkhatyn *zakaznik*; amounting to a total area of 54,100 ha (21% of the protected area complex) are cut off by the fence. (Kaczensky and Linnell, 2015) Potentially ungulates might irregularly pass the fence when broken by high water, but reportedly the fence after such events is immediately repaired. Leopards, however, seem to be able to pass the fence. (Kaczensky, pers. comm. 2019)

More recently at least in some sections a border fence has as well been erected at the Iranian side, further limiting ungulate movements (Ghoddousi, pers. comm. 2019).

Other threats:

Poaching is the major threat in the area, including the Badkhyz SPA and related protected areas in Turkmenistan. The rapid decline of population sizes of goitered gazelle, urial and Asian wild ass, with the likely extinction of the latter, can only be explained by intensive poaching. Fences blocking access to water and preventing transboundary movements may have contributed to the decline – directly by affecting habitat quality and indirectly by facilitating poaching and exacerbating its impact. Additionally, habitat quality at least in Turkmenistan is increasingly affected by overgrazing mainly with migratory livestock herds (Kaczensky and Linnell, 2015) and by transformation of areas suitable for irrigation into arable lands.

Recommendations for action:

The most important conservation actions would be the substantial improvement of control of the Badkhyz SPA and associated protected areas for effective prevention of poaching. Safe access to watering points is needed for all target species. Furthermore, livestock grazing needs to be prevented inside the SPA and be regulated across the entire landscape.

Border fences need to be modified with openings to allow for migration of ungulates. This requires the involvement of border guards in the conservation activities to achieve acceptance for such proposed modifications and to prevent poaching in such critical areas.

Once key conservation requirements – prevention of poaching and habitat quality, in particular access to water – are met, the possible remnants of the kulan population should be reinforced or the species be reintroduced by release of sufficient numbers of animals from well preserved populations. By this the site could again become a valuable conservation hotspot of all four target species.

Rustamov et al. (2015) suggested the expansion of the protected areas network in the Badkhyz region of Turkmenistan from 158,680 to 289,347 ha and the development of a transboundary protected areas network including the Badghyz in Afghanistan and the left bank of Harirod river.

Site ID: 7

Name: Aral Paygamar

Countries: AFG -(TKM)-UZB

Location:

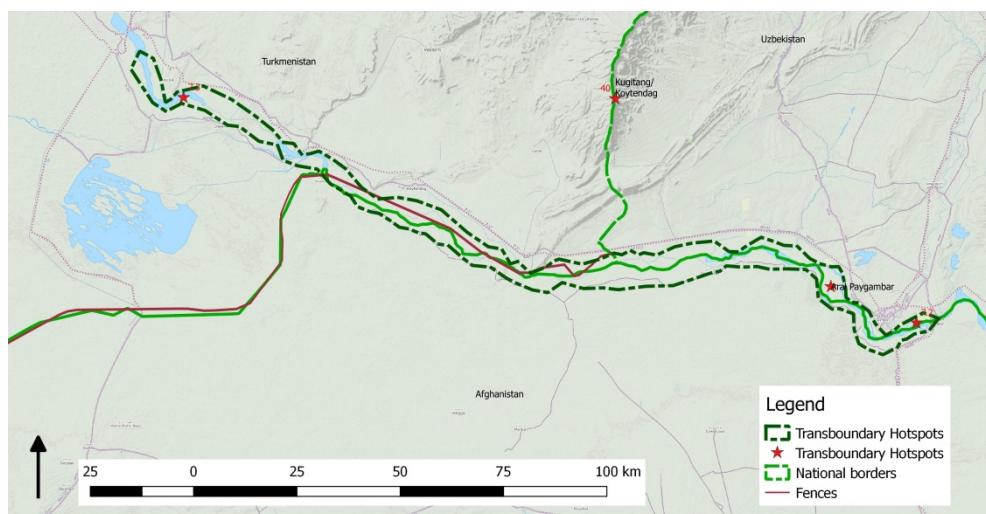
Administrative,

- Afghanistan, Balkh Province, Shorteppa district, Khulm Province, Kaldar district, Jwazjan Province, Qarqen and Khamyab districts;
- Turkmenistan, Lebap province (extent of the site into Turkmenistan to be verified)
- Uzbekistan, Surkhandarya Province

Geographic area:

- Riparian areas near Termez, downstream of “friendship” bridge, inclusion of area upstream of the bridge thinkable;
- Remark: The range area of CEHA in this area as indicated in the CAMI Atlas seems to be larger than the suitable habitat visible in satellite imagery (Bing Aerial, Google Earth).

Coordinates: N 37.297403°, E 67.137200°; N 37.219264°, E 67.368819°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Hindukush Highlands, Turanian (Kazakh desert scrub-steppe);

WWF Ecoregion (Olson et al., 2001): Badghyz and Karabil semi-desert, Central Asian riparian woodlands;

Riparian forest, riparian woodland, reeds, agricultural lands, semi-desert

Species:

Bukhara deer:

Population size: Turkmenistan about 50 animals since 2003 at least until 2011 and (Pereladova 2013); Afghanistan and Uzbekistan unknown, but likely shared population with Turkmenistan. Normatov (2016) assessed the current population size with about 100 animals.

Movements: No documented transboundary movements known, but as the national borders of AFG with TKM and UZB are in the river course and the border between TKM and UZB crosses the border such movements are highly likely, although there is a fence along the border of Turkmenistan. The population is divided by the city of Termez into an eastern and western part (Normatov, 2016);

Importance of transboundary population: Population estimates for the years 1999-2011 for Turkmenistan by Pereladova (2013) indicate a significant population. This population is particularly important as it is one of the few autochthonous populations. There is some

potential that this population can become connected with the population in Sites #4 and #5, although Termez as a major city and the “Friendship” bridge may hamper migration.

Persian leopard:

Population size: No permanent population, but occasional occurrence is possible Marmazinskaya 2016.

Movements: It is likely that leopards use the riparian forests of the site as linking connection between populations in the Kugitang and Babatag Ranges (Normatov, 2016).

Importance of transboundary population: The transboundary area is an important connection between isolated population patches despite the area probably has no resident leopards.

Conservation significance:

The area includes present and past range areas of Bukhara deer. There is potential for the presence or recovery of a transboundary population of the species, which might become linked with populations further upstream. The site might be of importance as a connecting link for leopards between ranges in the Kugitang or further in the west and in the Babatag in the east.

Protected areas status:

The area includes former Aral Paygamar SPA (UZB), which has been closed in the 1990s.

Barriers for migration:

Turkmenistan has a border fence (chain-link, high, not covered) along its border (CAMI Atlas referring to Kaczensky). However, it is technically unlikely that such a fence can be located in the actual riparian areas and where it crosses the river course can permanently block migration of Bukhara deer. The city of Termez and the “Friendship” bridge are other barriers to migration (Normatov, 2016), but observations from Zarafshon National Park in UZB (Marmazinskaya, pers. comm. 2018) suggest that Bukhara deer can live close to urban areas and may cross highways and other infrastructure.

Other threats:

- Habitat degradation caused by tree cutting, livestock grazing and changing riverflow dynamics;
- Poaching is likely, but at least from the Uzbekistan side prevented by the border zone and its protection (Normatov, 2016).

Recommendations for action:

- Transboundary communication and coordinated assessment and monitoring of population status and movements;
- Habitat conservation;
- Prevention of any poaching through law enforcement, collaboration with border police and community involvement;
- Assessment of barriers and where necessary and technically feasible mitigation to facilitate migration.

Site ID: 8

Name: Jungarian Alatau

Countries: CHN-KAZ

Location:

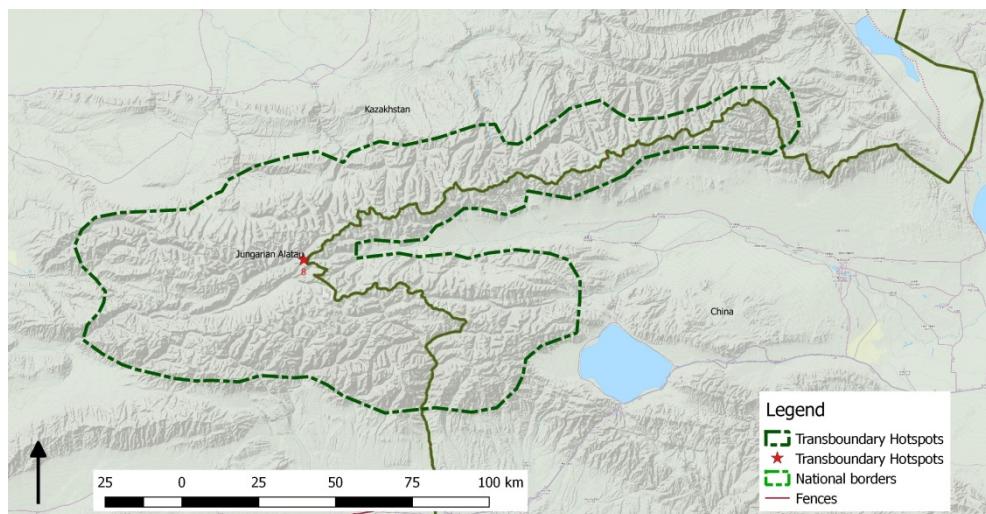
Administrative,

- China, Xinjiang Uyghur Autonomous Region, Bortala Mongol, Changji Hui and Ili Kazakh Autonomous Prefectures;
- Kazakhstan, Almaty Province.

Geographic area:

- Jungarian Alatau (other spellings Dzungar, Dzungar, Zhonggar), entire mountain area.

Coordinates: N 44.908111°, E 79.868378°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir-Tian Shan highlands;

WWF Ecoregion (Olson et al., 2001): Tian Shan montane steppe and meadows, Tian Shan foothill arid steppe;

High mountains, mountain steppe, mountain woodlands and coniferous forests.

Species:

Argali:

Population size: The OVAM range indicated in the CAMI atlas for this Site is not much linked to obvious physical features. It might in some parts include unsuitable areas, especially in the “possibly extant” areas in China, but also leaves out some suitable areas in Kazakhstan. No population figures could be obtained for the Site.

Movements: No documented transboundary movements known.;

Importance of transboundary population: The Jungarian Alatau is considered as main range area of a specific type of argali, the Littledale argali, which is, however, not recognized as a separate subspecies but considered as *Ovis ammon karelini* (Damm and Franco 2014). For the long-term conservation of this population transboundary connectivity would be important to maintain genetic integrity and diversity, to reduce extinction risk of isolated sub-populations and to allow access to seasonally varying habitat.

Snow leopard:

Population size: Kazakhstan 45-55 (Nyhus et al., 2016), in China snow leopard presence is confirmed (Nyhus et al., 2016), but no figures are available for this specific Site;

Movements: No documented transboundary movements known. Given the location of the national border at the main ridges such movements are very likely.

Importance of transboundary population: The Jungarian Alatau is an important and at this latitude the only link between the snow leopard's southern and northern range area. It is thus of key importance for the connectivity and genetic exchange across the snow leopard range and therefore for the global conservation of the species.

Conservation significance:

The area is of high significance for the conservation of argali, in particular the specific Jungarian population of *Ovis ammon karelini* and as linking element of the southern and northern part of the snow leopard range area. The Site overlaps with the GSLEP Landscape "Jungar Alatau".

Protected areas status:

China: None?

Kazakhstan: Lepsinskiy zakaznik, Verkhnekoksuskiy zakaznik and Toktinskiy zakaznik, Zhongar-Alatau state national nature park

Barriers for migration:

The CAMI Atlas indicates at least a partial border fence along the national border between China and Kazakhstan. The extent, completeness, exact location, technical features and barrier effect of this fence is unknown. As Soviet time border fences have often been erected several km away from the actual border, in easier accessible area, an unfenced strip along the border is likely. It is unknown if Chinese border authorities have erected their own fence, which in other areas has been the case at the actual border. If this is the case there would be a high likelihood that the area is at least in substantial sections fragmented by at least one border fence.

Other threats:

No specific threat assessment is available for this Site. Threats likely occurring include:

- Habitat degradation, mainly by overgrazing (more likely at the areas in CHN);
- Poaching.

Recommendations for action:

- Assessment of range areas, habitat use, and population sizes and trends of target species;
- Determination and implementation of conservation interventions;
- Transboundary collaboration, exchange of experience and mitigation of barrier effect of border fences.

Site ID: 9

Name: Tarbagatay/Saur Ranges

Countries: CHN-KAZ

Location:

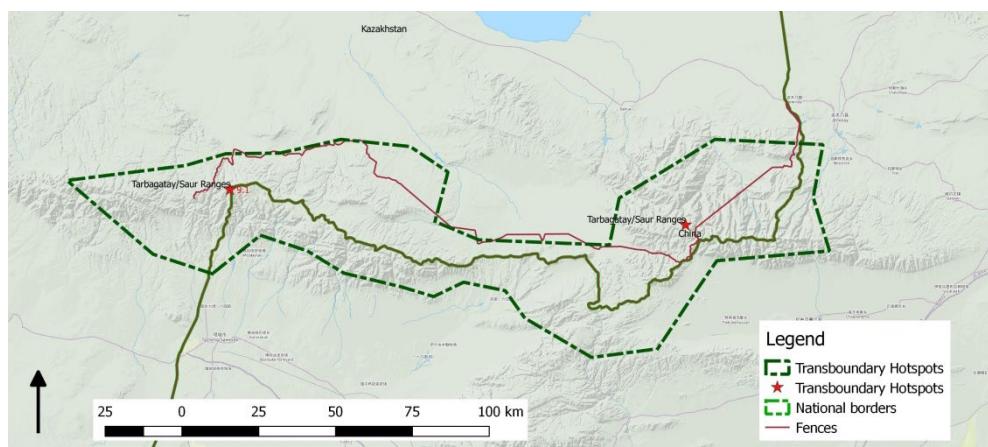
Administrative,

- China, Xinjiang Uyghur Autonomous Region, Tacheng Prefecture;
- Kazakhstan, Eastern Kazakhstan Province, Zaysan district.

Geographic area:

- Tarbagatay and Saur (other spelling Sair) Ranges, continuous area along the CHN-KAZ border.

Coordinates: N 47.212407°, E 83.021317°; N 47.100329°, E 85.150187°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Altai highlands, bordering the Pontian Steppe and the Mongolian-Manchurian Steppe;

WWF Ecoregion (Olson et al., 2001): Altai alpine meadows and tundra, Altai steppe and semi-desert;

Mountain steppe, mountain woodlands and coniferous forests.

Species:

Argali:

Population size: The range area of OVAM in the CAMI Atlas includes large areas without argali.

Kazakhstan: Hunting management areas "Naryn" (Tarbagatay) 141 recorded at 31,500 ha surveyed and "Zaysan" (Saur) 279 at 25,670 ha (V.I.Vernadskiy Non-Governmental Ecological Foundation, 2018), numbers in other areas not known; China unknown;

Movements: Seasonal migrations, including spatially segregated habitat use by males and females with young, have been reported by local wildlife managers. Such migrations are heavily impeded by border fences.;

Importance of transboundary population: The Site is considered as main range area of a specific type of argali, the Sair argali, which is, however, not recognized as a separate subspecies but considered as *Ovis ammon collium* or *O.a.karelini* (Damm and Franco 2014). For the long-term conservation of this population transboundary connectivity would be important to maintain genetic integrity and diversity, to reduce extinction risk of isolated sub-populations and to allow access to seasonally varying habitat.

Snow leopard:

Population size: The area is included in the range area map of the species. In Kazakhstan records of snow leopard mainly occur near Muztau peak (3,723 m NN) in Saur Range, but no

snow leopards have been recorded in Tarbagatay for many years and not population size is available for the Site (Nyhus et al., 2016). In China snow leopard presence is not mentioned from this Site by Nyhus et al. (2016);

Movements: No documented transboundary movements known, but despite border fences likely because of smaller distances between potential stepping stones in China;

Importance of transboundary population: The Site is a linking element or stepping stone connecting the northern and southern range areas of snow leopard.

Conservation significance:

The area is of high significance for the conservation of argali, in particular the specific "Sair" population of *Ovis ammon collum* (?) and as linking element of the southern and northern part of the snow leopard range area.

Protected areas status:

China: None?

Kazakhstan: Tarbagatay zakaznik, several game management areas, in particular "Naryn" and "Zaysan"

Barriers for migration:

Kazakhstan and China have barbed wired fences, which are barriers to the movement of argali and other wildlife. The Chinese fence is located directly at the border, at the main watershed of the Tarbagatay range. The Kazakhstani fence, built in the 1970s in Soviet times but still maintained, is located at the bottom of the main slope of Tarbagatay range, about 20 to 25 km north of the actual border. In Kazakhstan a survey of two game management areas (V.I.Vernadskiy Non-Governmental Ecological Foundation, 2018) found most argali within the fenced border zone, but only few groups and low numbers outside the fenced zone. The fences seriously hamper connectivity and exchange within the population. Local wildlife managers reported that only high snowdrifts occasionally facilitate crossing of the fences by argali. For snow leopard the fences might be easier to pass.



The border fence in Kazakhstan is a near total barrier for any wildlife movement.

Photo: Michel

Other threats:

- Poaching;
- Habitat degradation and replacement of argali by increasing livestock numbers.

Recommendations for action:

- Establishment of incentives for argali conservation and prevention of poaching through regulated hunting, benefiting game area holders and local people;
- Regulation of livestock grazing and involvement of local people in management and sustainable use of argali;
- Transboundary collaboration for exchange of information, coordinated monitoring and conservation intervention;
- Enhanced permeability of the border fences for argali and snow leopard.

Site ID: 10

Name: Khan Tengri region

Countries: CHN-KAZ-KGZ

Location:

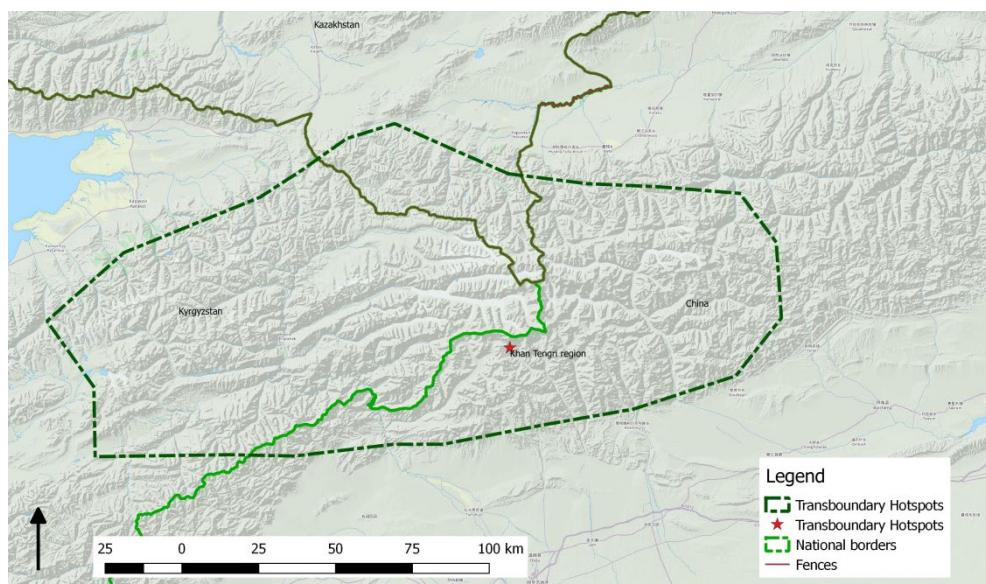
Administrative,

- China, Xinjiang Uyghur Autonomous Region, Aksu and Ili Kazakh Autonomous Prefectures;
- Kazakhstan, Almaty Province, Raiymbek District;
- Kyrgyzstan, Issyk-Kol Region, Ak-Suu District.

Geographic area:

- Khan Tengri massif in the Tian Shan.

Coordinates: N 41.993587°, E 80.126861°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir-Tian Shan Highlands;

WWF Ecoregion (Olson et al., 2001): Tian Shan montane steppe and meadows, Tian Shan montane conifer forests;

High mountains, mountain steppe, mountain woodlands and coniferous forests.

Species:

Argali:

Population size: The Site is part of the range area of *Ovis ammon karelini* and recent observations (e.g. Asykulov pers. comm. 2017, transboundary pilot survey in KAZ and KGZ by Snow Leopard Transboundary Initiative (2018)) confirm its presence. A survey in 2010 covering only one valley in the west of the Site in KGZ yielded records of 147 argali (Davletbakov and Musaev, 2012).

Movements: Movements between KAZ and KGZ have been repeatedly observed, e.g. by Asykulov in 2017. In what extent border fences hamper these movements is currently unclear, but reportedly (Ismailov pers. comm. 2019) larger areas are unfenced and existing fences are at least partly at lower elevations, outside of the argali habitat.

Importance of transboundary population: The argali in the Site are part of a larger transboundary population with CHN. Connectivity between KGZ and KAZ is important for the conservation of argali in the eastern part of northern Tian Shan. Overall argali population in Kyrgyzstan, Issyk-Kol and Naryn Provinces, is stable and only partly relies on transboundary habitat.

Snow leopard:

Population size: As result of a transboundary pilot survey in KAZ and KGZ by Snow Leopard Transboundary Initiative (2018) ten snow leopards (incl. female with two cubs) were guessed to be present in the KAZ part and at least four or five (incl. female with two sub-adults). These results are not conclusive and likely the total number is higher, but they indicate the presence of a reproducing population.

Movements: No documented transboundary movements have been recorded, but they can be assumed given the geography of the Site.

Importance of transboundary population: Similarly as Sites #8 and #9, this Site represents one of the bottleneck areas of key importance for connectivity between the northern and southern range areas of the snow leopard. The presence of several reproducing females increases the importance of this transboundary population.

Conservation significance:

The area is of high conservation significance, particularly for snow leopard, but also for argali. The remoteness, integrity and size of little or not transformed high mountain ecosystems contributes to this. The Site overlaps with the GSLEP Landscapes “Northern Tien Shan” and “Sarychat”.

Protected areas status:

Kazakhstan: Assigned game management area (hunting ground)

Kyrgyzstan: Khan Tengri NP (planned with 275 800 ha)

Barriers for migration:

The border fence indicated in the CAMI Atlas exactly along the border of Kazakhstan seems to be inaccurate. A new border fence is reportedly planned between China and Kyrgyzstan (Rosen pers. comm. 2019). According to Ismailov (pers. comm. 2019) border fences from China towards Kazakhstan and Kyrgyzstan have been erected, except in the highest parts of the Khan Tengri massif. The Soviet period border fence is at about 5 – 10 km distance from the border form Kazakhstan and Kyrgyzstan (?) towards China. It is still maintained in Kazakhstan, but there dismantling had been considered. A new border fence (since about 2010) from Kazakhstan towards Kyrgyzstan seems to exist in some locations, but the exact status is unknown.

Other threats:

- Poaching in easier accessible areas;
- Potentially future expansion of grazing into currently unused areas, causing competition, habitat degradation and disturbance, in particular by herders dogs and if associated with poaching.

Existing or planned transboundary activities:

- Snow Leopard Transboundary Initiative (NABU, Marwell)

Recommendations for action:

- “Belt and Road Initiative”: Assessment of potential impact and political intervention for avoidance, mitigation and compensation of impact.
- Transboundary assessments and monitoring of wildlife populations and habitats;
- If necessary, mitigation of barrier effect of existing and planned border fences, work with border guards for involvement in conservation;
- Prevention of expansion of grazing areas;
- Involvement of local people in management and sustainable use of argali where appropriate;
- Addressing of potential adverse impact of tourism development.

Site ID: 11

Name: Altai

Countries: CHN-KAZ-MNG-RUS

Location:

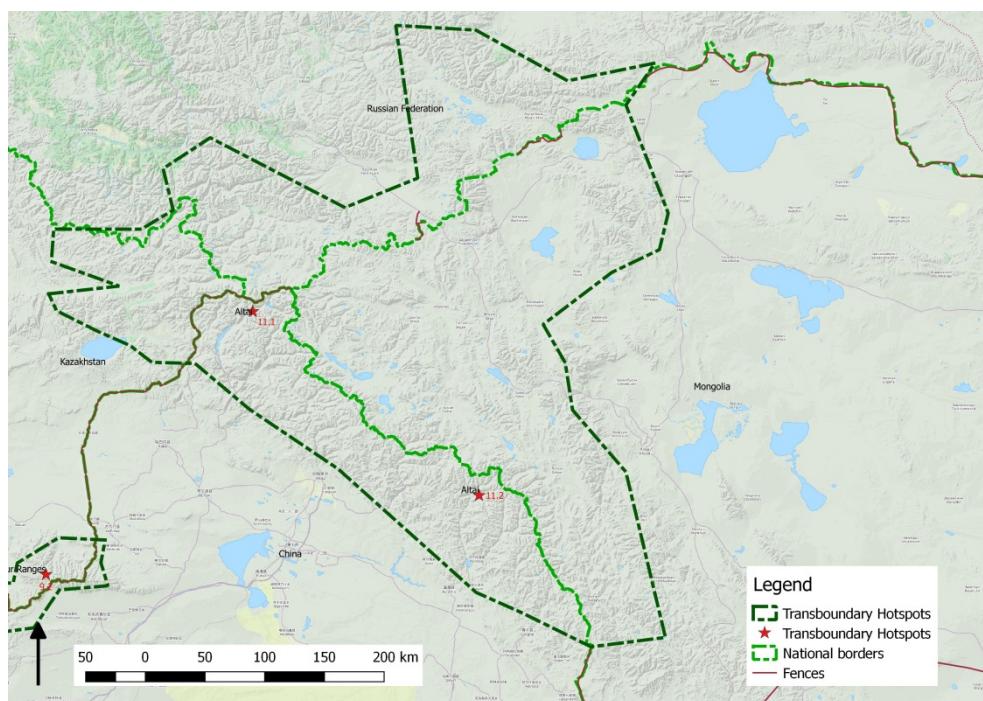
Administrative,

- China, Xinjiang Uyghur Autonomous Region, Altay Prefecture;
- Kazakhstan, Eastern Kazakhstan Province, Raiymbek District;
- Mongolia, Uvs and Bayan Ulgii Aimags;
- Russian Federation, Altay Republic, Kosh-Agach District, Tuva Republic, Buryatiya.

Geographic area:

- Central part and SE part of Altai Mountains, including among others Saylyugem Range, Chikhacheva, Tsagaanshuvuut;
- Specific important areas to be determined!

Coordinates: N 49.006372°, E 87.394649°; N 47.681114°, E 89.849796°; Specific locations recommended by Poyarkov (pers. comm. 2019): N 49.492°, E 88.551° (Saylyugem); N 49.740 E 89.698° (Chikhacheva); N 50.326°, E 90.021° (Tsagaanshuvuut);



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Altai Highlands;

WWF Ecoregion (Olson et al., 2001): Altai alpine meadows and tundra, Altai montane forest and forest steppe, Sayan alpine meadows and tundra, Great lakes basin desert steppe; High mountains, mountain steppe, mountain woodlands and coniferous forests, semi-desert.

Species:

Argali:

Population size: In Russia WWF (2017) recorded 1,236 argali, out of these 945 animals on the Saylyugem Ridge at the border with Mongolia. Harris et al. (2010) estimated 2,311 argali in Khovd and 2, 123 in Bayan Ulgii Aimags, most of these within the approximate boundaries of the Site. In Kazakhstan numbers are very low (declining from 50-55 in 2005 to 10 in 2011-2013 (CMS 2014). No argali figures are known from the Chinese part of the Site. Overall numbers of argali within the site might be in the range of 4,000-5,000 animals.

Movements: Argali moive regularly between Mongolia and Russia. The drivers of movement are seasonality of forage availability, driven by vegetation phenology, snow cover and livestock grazing (WWF 2017, Paltsyn et al., 2011).

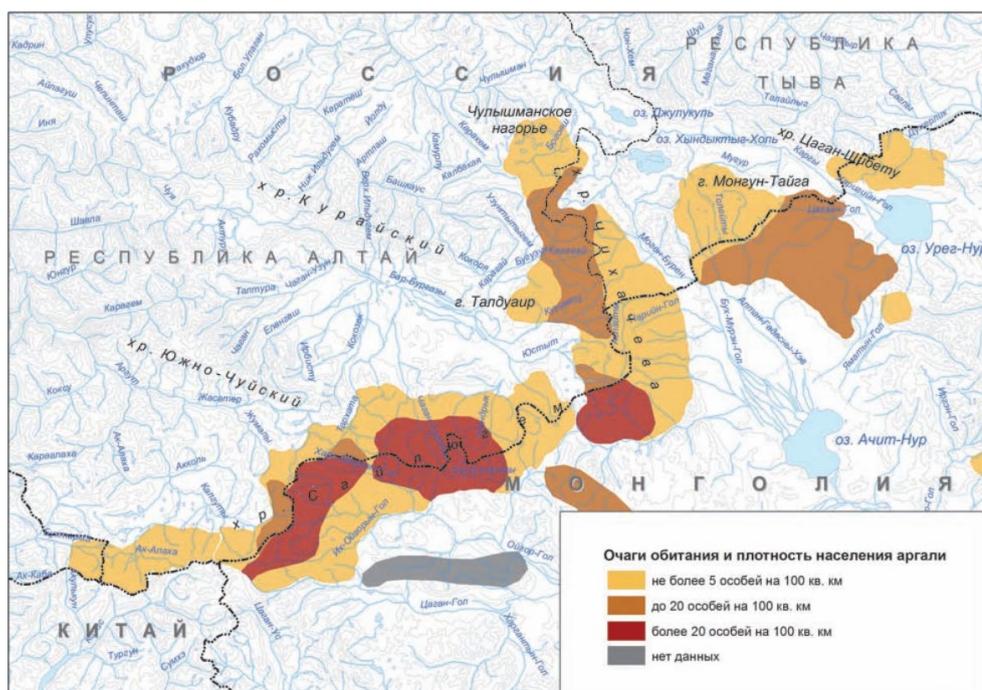
Importance of transboundary population: The main range areas of Altai argali *Ovis ammon ammon* are located within the Site. The share of the population occurring immediately close to the national border between Mongolia and Russia and potentially being transboundary has been assessed in the range of 1, 100-1,700 animals (Paltsyn et al., 2011). Access to habitats of seasonally varying quality across the national border is essential for the conservation of these argali. Actual transboundary movements might be impeded by border fences in key areas (Chimmedorj et al., 2013).

Snow leopard:

Population size (Nyhus et al., 2016): In the Kazakhstan part the number of snow leopard unlikely exceeds 10 individuals. In Russia's Altay-Sayan region the population is likely 70-90 animals. The Mongolian Altai is considered a high density area. Also from the Altai in China snow leopard occurrence is reported.

Movements: No documented transboundary movements known, but highly likely;

Importance of transboundary population: The Site and its population make up a substantial part of the snow leopard's norther range area. As the Site is shared between four countries, the entire snow leopard population can be considered transboundary. While permanent occurrence might be patchy, as suggested by the map provided for Mongolia in Nyhus et al. (2016), survival of the snow leopard in the region depends on connectivity and opportunities of dispersal and recolonization. Lukarevskiy (2015 and pers. comm.) expressed concerns that in some parts of the range area in the Russian Altai-Sayan very few or no reproducing females survived and only dispersing males occur there, thus questioning the mid-term perspectives of these range area patches without augmentation.



Density of argali in the border region of Mongolia and Russia; Source. Paltsyn et al., 2011.
(Legend from top to down: no more than 5/100 km², up to 20/100 km², >20/100 km², no data)

Conservation significance:

The entire Altai-Sayan region is of high conservation significance for the two target species and in general terms of biodiversity and ecosystems. In particular Saylyugem Range with its national park is of importance for both species, argali and snow leopard (Poyarkov, pers.).

com. 2019). The exact areas of relevance as transboundary hotspot under CAMI have to be determined in more detail and may require expansion and modification.

Protected areas status:

China: Khanas
Kazakhstan: Katon-Karagay State National Natural Park
Mongolia: Tsagaan Shuvuut and Siilkhem Nuruu SPAs, Sailyugem NP, Altai-Tavyn-Bogd NP, Gulzat Local Protected Area
Russia: Saylyugem National Park, Altai SPA and section “ Mongun-Tayga” of Ubsungurskaya Kotlovina SPA, Kosh-Agach, PA “Zona Pokoya Ukok”,

Barriers for migration:

The area has at least in parts border fences, which negatively impact on argali through interruption of seasonal migrations, hindering access to critical habitat, isolation and direct mortality. Poyarkov (pers. comm. 2019) mentions that border fences are currently mainly built by the Mongolian border authorities.

Most of the border fence between Altai Tovon Bogd and Uvs Lake is of unknown status. For the CAMI Atlas Paltsyn has mapped several segments and Chimededorj et al. (2013) suggests at least partial fencing in some areas, and Badamjav has provided the coordinates of several fences. One of the impermeable border fences of about 50 km length has been erected by Mongolian border guards in 2000 along the Ak-Adyr range and the Mongun-Tayga massif. This fence seriously hinders the movement of argali between Mongolia and Tuva and caused a decline of argali there. Deaths of argali have been reported, which entangled in the border fence. (Paltsyn et al., 2011)

A further barrier for migration and cause of fragmentation might become the gas pipeline from Russia to China (CAMI Atlas), which is (or was planned) to cross Mongolia as well. (Paltsyn et al., 2011)

Other threats:

- Poaching of argali and snow leopard;
- Snow leopard as occasional bycatch of illegal musk deer snaring (Poyarkov, pers. comm. 2019);
- Over-hunting of ungulates affecting snow leopard (Poyarkov, pers. comm. 2019);
- Increase in livestock numbers and resulting habitat degradation, forage competition with argali and replacement of wild ungulates, human-wildlife conflict (snow leopard) and potentially disease transmission;
- Expansion of mining activities, potential industrial development at the Chikhacheva Range.

Existing or planned transboundary activities:

- Altai initiative between Mongolia/Russia/Kazakhstan (considerations of Transboundary Biosphere Reserve)

Recommendations for action:

- Intensified transboundary collaboration;
- Implementation of the conservation measures recommended in the Strategy for the conservation of snow leopard in Russian Federation (Istomov et al., 2015).
- Establishment of section of SPA Ubsungurskaya Dolina at the Sangilen Range in RUS (Poyarkov, pers. comm. 2019);
- Removal or mitigation of border fences in critical areas;
- Regulation of livestock grazing;
- Increase of anti-poaching efforts;
- Revision of argali hunting systems or introducing hunting schemes, which ensure effective involvement of and direct benefits for local communities and conservation.

Site ID: 12

Name: Southern Tien Shan

Countries: CHN-KGZ

Location:

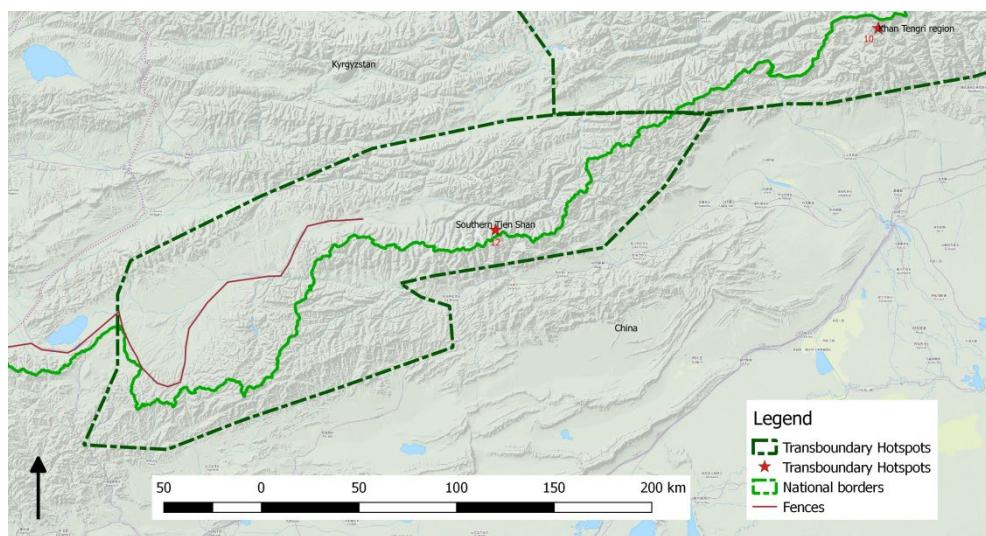
Administrative,

- China, Xinjiang Uyghur Autonomous Region, Aksu Prefecture, Kizilsu Kyrgyz Autonomous Prefecture;
- Kyrgyzstan, Issyk-Köl Province, Aksuu District and Naryn Province, Jeti-Oguz District.

Geographic area:

- Entire mountain range along the border.

Coordinates: N 41.092293°, E 77.839644°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir-Tian Shan Highlands;

WWF Ecoregion (Olson et al., 2001): Tian Shan montane steppe and meadows;

High mountains, mountain steppe, mountain woodlands and semi-desert.

Species:

Argali:

Population size: In Kyrgyzstan in Fall 2010 close to 12,000 argali have been recorded (Davletbakov and Musaev, 2012); China unknown;

Movements: Transboundary movements of argali have been observed and occur regularly (Davletbakov, pers. comm. 2010-2016), as far as not hampered by more recently built border fences from the Chinese side.

Importance of transboundary population: Approximately 50% of the argali recorded in the area of the Site in 2010 were recorded in the immediate border area. The overall sub-population in the region is one of the largest single argali sub-populations. It has been often attributed to *Ovis ammon polii*, but morphological differences and considerations of geographic barriers and linkages suggest that it might rather belong to *Ovis ammon karelini*. It would therefore be the largest compact population of this subspecies or represent an intermediate form.

Snow leopard:

Population size: Snow leopard occurs in the area, but no specific information on population size is available. Kachel (pers. comm. 2013) in one large hunting concession in the Kara-Say Syrte found evidence of very few snow leopards only, despite abundant prey species.

Movements: A study using collars has been conducted by Kachel (pers. comm. 2013-2018) outside of the Site. Results are not yet published. No documented transboundary movements known as so far no collaring took place in the area. Movements are however likely.

Importance of transboundary population: The snow leopards of the area are part of a larger connected population in the Tien Shan. As the area has a large wild ungulate population (argali and Asiatic ibex) it provides a good prey base. Because of comparably low number of livestock herds conflict potential is rather low. Also due to the species' low density and large spatial requirements the area is of high importance.

Conservation significance:

The entire Site is range area of both species and of high conservation significance for these species and for the mountain ecosystems of the southern Tian Shan. The Site partly overlaps with the GSLEP Landscape "Sarychat".

Protected areas status:

China: None?

Kyrgyzstan: Part of Issyk-Kol Biosphere Reserve, several hunting concessions.

Barriers for migration:

A Soviet times border fence exists in key sections in Kyrgyzstan. Due to its location several kilometers away from the actual border there is a comparably undisturbed border zone. However, the fence, despite having some gaps, is a barrier for argali migrations and causes fragmentation of population and habitat. There is no information available about a potential new border fence from the Chinese side. As such fence has been built or is under construction in other areas along the border of China with former Soviet republics there is a risk that such fence is planned, under construction or already built.

Other threats:

- Poaching of the target species (Kachel, pers. comm. 2013, found several leg-hold traps at sites typical for snow leopard presence);
- Intensive livestock grazing at the Chinese section and potentially expansion of livestock grazing and increase in livestock numbers in areas in Kyrgyzstan, which are currently unused or grazed in low intensity;
- Potentially development of mining activities.

Recommendations for action:

- "Belt and Road Initiative": Assessment of potential impact and political intervention for avoidance, mitigation and compensation of impact.
- Assessment of current state and planned development of the border fences and their impact;
- Development of removal or mitigation measures at border fences;
- Prevention of poaching, in particular through community involvement in and benefit sharing from regulated hunting of argali and ibex;
- Enforcement of ban of leg-hold traps in Kyrgyzstan, which are sometimes set under the pretext of wolf control;
- Regulation of grazing and establishment of seasonal and permanent grazing exclusion zones, control of dogs kept by herders (herd protection dogs and hunting dogs).

Site ID: 14

Name: Gobi desert / Yin mountains

Countries: CHN-MNG

Location:

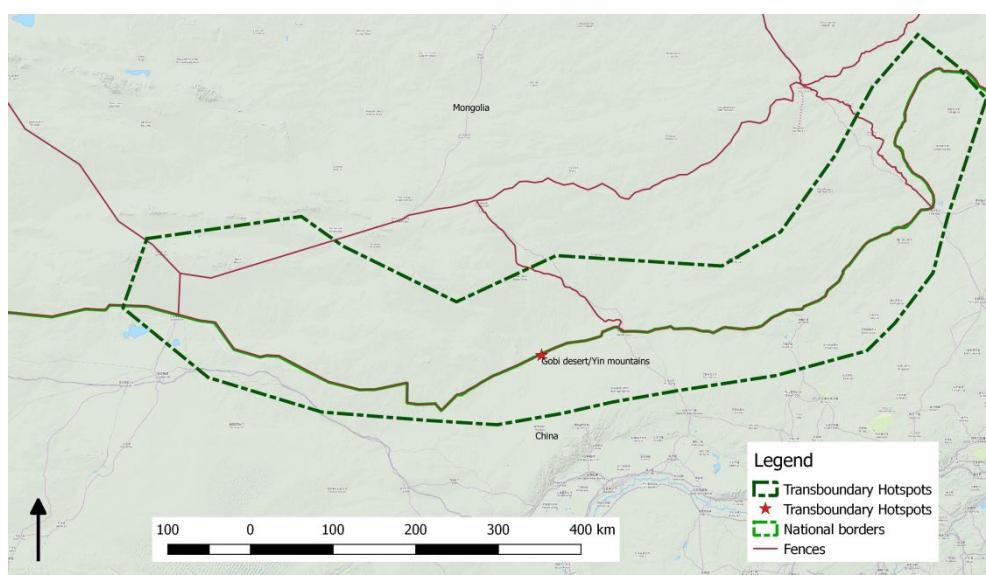
Administrative,

- China, Inner Mongolia Autonomous Region, Bayannur, Baotou, Ulanqab and Xilingol Prefectures;
- Mongolia, Ömnogovi and Dornogovi Aimags.

Geographic area:

- To be defined! Possibly several separate sections.

Coordinates: N 42.163084°, E 106.423024°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Taklamakan-Gobi Desert;

WWF Ecoregion (Olson et al., 2001): Alashan plateau semi-desert, Eastern Gobi desert steppe;

Desert, semi-desert and desert-steppe, plains, dunes and mountainous areas.

Species:

Goitered gazelle:

Population size: The Site is part of the larger Range area of goitered gazelle in the Gobi desert of Mongolia, which supports the world's largest population of the species with an estimate of 28,462 in 2012-2015 (Buuveibataar, 2017). Presence confirmed with camera traps by Augugliaro et al. (2019) in Small Gobi A SPA, but not in unprotected areas north of it.

Movements: No documented transboundary movements are known and they are likely hindered by border fences. China is not indicated as part of the range area of the species in the CAMI Atlas.

Importance of transboundary population: The population is currently not known as being transboundary. CAMI Atlas shows the Mongolian part of the Site as range area, but not the part in China. If the species still occurs as well at the China side, the population is likely functionally separated. The population of the Site is large and of global importance, but its conservation status is independent of the potential transboundary character.

Asian Wild Ass:

Population size: The Site is part of the larger Range area of khulan in the Gobi desert of Mongolia, which supports the world's largest population of the species with an estimate of 35,899 in 2012-2015, 75% of the global population (Buuveibataar, 2017). Presence confirmed with camera traps by Augugliaro et al. (2019) in Small Gobi A SPA, but not in unprotected areas north of it.

Movements: No documented transboundary movements are known and they are prevented by border fences. A small section in China is indicated as part of the range area of the species in the CAMI Atlas.

Importance of transboundary population: The population is currently not transboundary. If the species still occurs as well at the China side, the population is functionally separated. The population of the Site is large and of global importance, but its conservation status is independent of the potential transboundary character. However, survival of the species in the China part of the Site will depend on transboundary connectivity.

Argali:

Population size: The national ungulate survey in 2009 yielded an estimate of 2,913 argali in Dornogovi Aimag and 2,400 in Ömnögovi Aimag (Harris et al., 2010), which are partly included in the Site. As of 2009, argali within Inner Mongolia (Harris et al., 2009) appear to be restricted to extremely small populations in three areas. They found that argali had disappeared from several areas and small numbers of argali persist in the Yabrai (Yubulai) Shan range, the Hada Shan area and the Erenuo'ersumu region of Sunitezuo Banner.

Presence confirmed with camera traps by Augugliaro et al. (2019) in Small Gobi A SPA, as well as in unprotected areas north of it (lower relative abundance than in the SPA).

Movements: A border fence hinders movements, but Harris et al. (2009) found that locally argali were able to cross (jump) the border fence. If this is still possible, or if the fence has since then been enforced, is unknown.

Importance of transboundary population: In Mongolia the conservation status of argali is secure. The future of argali within Inner Mongolia appears tenuous, most likely dependent on the ability of dispersing individuals from Mongolia to supplement existing groups or colonize new areas.



Seven argali, mid November 2008 near the border with Mongolia, behind the border fence. Sign from argali was also found on the Inner Mongolian side of the fence. Photo: Bi Junhuai, from Harris et al., 2009.

Mongolian gazelle (dzeren):

Population size: The area is part of the species range area in Mongolia and the range area in the CAMI Atlas appears to reach into China in the eastern part of the site. No site-specific population figures are available.

Movements: Mongolian gazelles are seasonally migrating, but movements do not appear to follow a specific pattern and do not show fidelity to any given range. Cross-border migrations in the area are interrupted by the Chinese border fence.

Importance of transboundary population: There is currently no information on transboundary movements of any substantial parts of the population available. Any population in China – if still extant – would likely depend on at least occasional immigration from Mongolia.

Snow leopard:

Population size: Presence of the species for the first time recorded with camera traps by Augugliaro et al. (2019) in Small Gobi A SPA.

Movements: No information available.

Importance of transboundary population: Permanent population highly unlikely. Dispersal movements might be transboundary.

Conservation significance:

The Site is of high significance for the conservation of goitered gazelle and khulan, but is also important for argali, represented by the subspecies *O.a. darwini*, and potentially for dzeren. However, currently the fenced border with China is more or less the southern boundary of the range areas of these species and – if at all existing – remnant populations of the three species appear to be very small.

Protected areas status:

Mongolia: Small Gobi A SPA (Augugliaro et al., 2019), four protected areas (Buuveibataar et al., 2016), but none exclude livestock grazing.

Barriers for migration:

There are two impermeable linear infrastructures constructed in the 1950s, namely the fenced border with China, and the Trans Mongolian Railroad corridor (fenced on both sides). In the west there are two parallel paved roads that connect major mines with the Chinese border crossing. (Buuveibataar et al., 2017).

Other threats:

- Forage competition with livestock, habitat degradation and potentially disease transmission caused by livestock. The Southern Gobi is the centre of the Cashmere goat industry in Mongolia (Berger et al., 2013).
- Mining and related infrastructure development.
- Poaching.

Recommendations for action:

- Fence removal proposed at the railroad crossing the site in the east as well as further to the north. Fence removal would be between Station 21 (N 43.749708°, E 111.856505°) a few kilometres north of Zamyn-Uud near the border with China and Airag (N 45.778356°, E 109.335991°); north of Airag the fence should be modified; only in areas with human settlements sections with fences should remain to prevent accidents. (Olson, pers. comm. 2019)
- Regulation of grazing, veterinary measures to prevent disease transmission and the creation and/or expansion of livestock exclusion zones.

Site ID: 15

Name: South-western Gobi

Countries: CHN-MNG

Location:

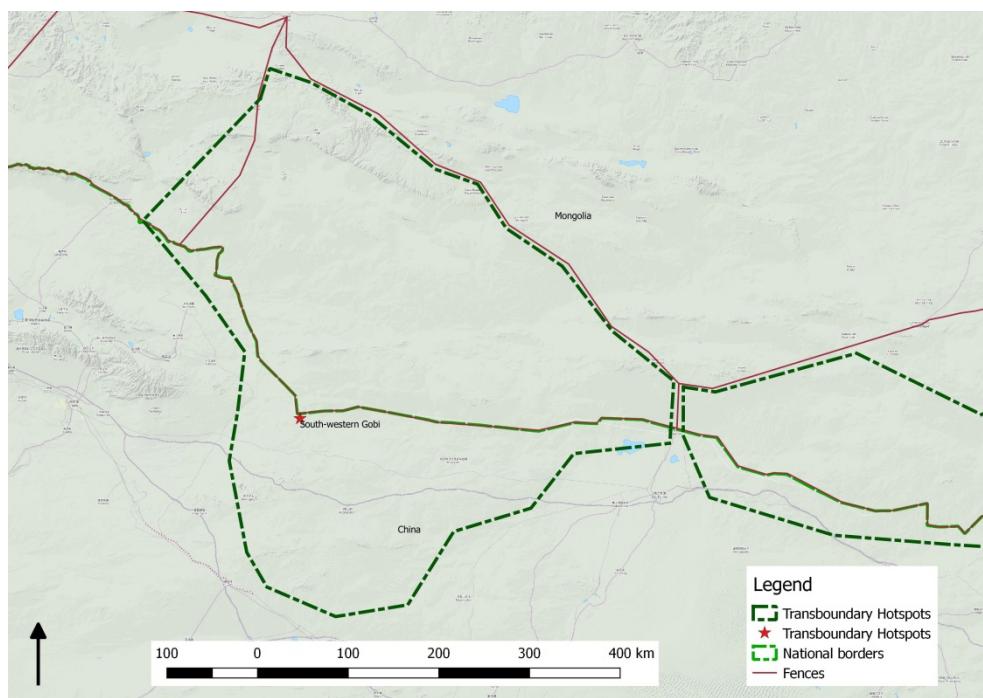
Administrative,

- China, Gansu Province, Kumul, Jiayuguan and Jiuquan Prefectures;
- Mongolia, Govi-Altai and Bayanhongor Aimags.

Geographic area:

- Mongolian Trans-Altai Gobi desert, largely identical with Great Gobi A SPA.

Coordinates: N 42.683870°, E 96.422978°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Taklamakan-Gobi Desert;

WWF Ecoregion (Olson et al., 2001): Alashan plateau semi-desert, Junggar Basin semi-desert and Altai montane forest and forest steppe;

Desert and semi-desert, small areas with steppe and woodland.

Species:

The CAMI Altas shows range area overlaps between species of plain semi-desert (wild camel, Asian wild ass, goitered gazelle) and species of mountainous areas (argali and snow leopard). This overlap is less real habitat sharing than an issue of the resolution of the range areas layers.

Wild camel:

Population size: Population estimates for wild camels vary widely and were determined using several different methods, unfortunately precluding direct comparisons to assess demographic trends. Estimates for Mongolia, i.e. for this Site, vary between 350 and 2,000 (Adiya, 2012). Several hundred wild camels may exist in China, but during one survey, Adiya and Dovchindorj (2006) observed only 10 wild camels in the Arjinshan Mountain and Gumuago Desert in China (Adiya, 2012);

Movements: Wild camels are highly mobile and roam within large areas. The border fence is an obstacle to transboundary movements.

Importance of transboundary population: The population of the Site hosts one of only three populations of wild camel. This is the only potentially transboundary and probably the largest population of the species.

Asian Wild Ass:

Population size: 1,500 in Trans-Altai Gobi (Kaczensky et al., 2015a) of Mongolia. Numbers in adjacent China are not known.

Movements: Generally wild asses are highly mobile and regularly move long distances in search of water and forage. Kaczensky et al. (2011) found in the area individual home ranges of collared khulan of 14,695–16,907 km². With the upgrading of the fence along the international border in the 1980s and 1990s, population exchange between Mongolia and China has likely ceased or at least become minimal. Consequently, the Chinese populations should be regarded as separate from Mongolia. (Kaczensky et al., 2015a);

Importance of transboundary population: The population is currently not transboundary. The conservation status in Mongolia is independent of the potential transboundary character. However, survival of the species in the China part of the Site will depend on transboundary connectivity.

Goitered gazelle:

Population size: The Site is part of the larger range area of the species in southern Mongolia. No site-specific information is available.

Movements: No documented transboundary movements known. Regular movements are hindered by the border fence.

Importance of transboundary population: There is currently no functionally transboundary population. The conservation status in Mongolia is independent of the potential transboundary character. However, survival of the species in the China part of the Site will depend on transboundary connectivity.

Argali:

Population size: The 2009 mountain ungulate survey yielded estimates of approximately 2,000 argali for the two aimags (Harris et al., 2010). The Site covers only a small portion of the argali habitat of these aimags and so the argali numbers are much lower. In China argali range area in the Site is not immediately at the border and numbers are unknown.

Movements: No movement data are known. Border fence and distance of range area in China from the border, make transboundary movements unlikely.

Importance of transboundary population: The population is currently not transboundary. The conservation status in both countries is independent of the potential transboundary character. Improved connectivity would positively influence the conservation status and improve the genetic diversity of small argali groups and increase chances of recolonization of sites where argali is extinct.

Snow leopard:

Population size: The snow leopard occurs in the Site in Mongolia and probably in an area located to the west in China. No population numbers are known.

Movements: No documented transboundary movements known. Border fences and habitat characteristics limit transboundary movements.

Importance of transboundary population: Transboundary character of the population not confirmed.

Conservation significance:

The Site is of global significance, mainly because of wild camel. The species survives only in one population in the Mongolian Trans-Altai Gobi desert (this Site) and in three groups in China, namely a small area of the Taklamakan Desert, the Gashun Gobi in the north of Lop Nur and Arjin Mountain. (Adiya et al., 2012) The area is further important for the conservation of wild ass, goitered gazelle and argali as well as snow leopard.

Protected areas status:

Mongolia: Great Gobi A SPA

Barriers for migration:

The border fence from China is the largest and most significant barrier. Highways and railways are among the more common movement barriers and became prominent in the north western China in Gansu and Xinjiang provinces. In particular, the Silk Road and later the Gansu-Xinjiang highway and the Lanzhou-Xinjiang railway have separated the Lop Nur Lake region from the Altai-Gobi Desert. In addition, a green corridor from Weili to Ruoqiang, the Tarim River and Lop Nur Lake has separated camel populations in the Taklamakan Desert from populations in the Gashun Gobi Desert and the northern piedmont of Arjin Mountain. Accordingly, this highly endangered animal nowadays faces the disadvantaged situation of being dispersed in at least three isolated populations. A mining area near the border in China forms one of the biggest barriers in North-western China. (Adiya et al., 2012; Adiya in litt. 2019)

Other threats:

- Livestock – The Great Gobi A SPA is normally not allowed to be grazed by livestock, but under exceptional circumstances grazing is permitted and causes forage and water competition and disturbance keeping wildlife away from essential resources;
- Hybridizing of wild and domestic camels from the buffer zone and during temporary grazing (wild camel bulls taking domestic females in their harems);
- Poaching by local people and border guards (reportedly effectively prevented by Great Gobi A SPA (Adiya et al., 2012);
- Illegal and legal (in China) mining;
- Drying up of water sources.

Recommendations for action:

- It is crucial to begin more active collaboration between China and Mongolia. Participants in wild camel conservation from both sides of the border will need to trust one another and have a desire to communicate more frequently and openly. Perhaps the most important tasks are increasing awareness of cross-boundary issues and improving communication between agency personnel, biologists, and conservationists working on wild camel conservation in China and Mongolia. Additional joint meetings on camel conservation would facilitate this process, as would joint research projects. Addressing border issues may require involving military border guards and foreign affairs officers.
- Specific measures should include:
 - Protect and remote monitoring of the water in the border area;
 - Joint monitoring and observation of wildlife movement along the border in China and Mongolia, with continuous monitoring by a camera trapping study along the border in Mongolian side and if possible in Chinese side in the near future;
 - To establish wildlife movement corridor area in the unfenced area of the Great Gobi A SPA based on joint research study between Mongolia and Chinese researchers;
 - Stop the operation of the mining site near border in China.
- Regulation of grazing and livestock in critical areas of the buffer zone at the boundaries of Great Gobi A SPA.

Site ID: 16

Name: Jungarian Gobi

Countries: CHN-MNG

Location:

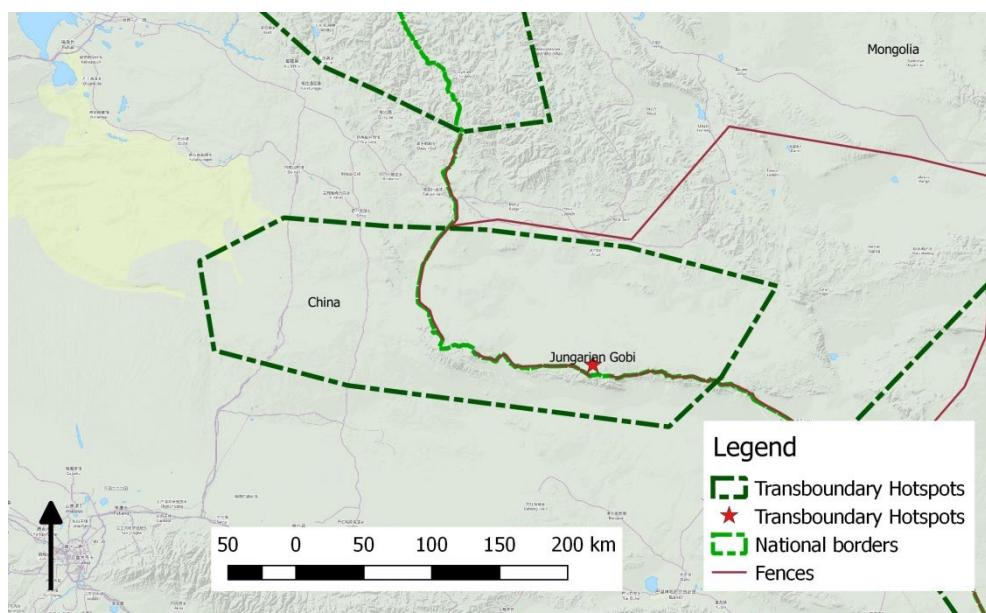
Administrative,

- China, Xinjiang Uyghur Autonomous Region, Kumul and Changji Hui Autonomous Prefecture;
- Mongolia, Khovd Aimag.

Geographic area:

- Western (Jungarian) Gobi desert, in Mongolia largely identical with Great Gobi B SPA.

Coordinates: N 45.087319°, E 92.261473°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Taklamakan-Gobi Desert;

WWF Ecoregion (Olson et al., 2001): Junggar Basin semi-desert;

Desert and semi-desert, small areas with steppe.

Species:

The CAMI Atlas shows range area overlaps between species of plain semi-desert (wild camel, Asian wild ass, goitered gazelle) and species of mountainous areas (argali and snow leopard). This overlap is less real habitat sharing than an issue of the resolution of the range areas layers.

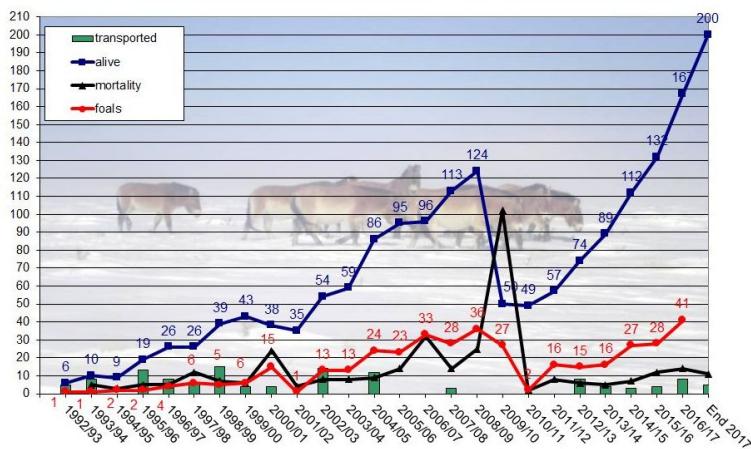
Przewalski's horse:

Population size: The Site hosts the largest free roaming population of Przewalski's horse. End 2017 there were 200 individuals (International Takhi Group, website⁹, Burnik Šturm et al., 2017). In China since 2001 horses have been released into the nearby Kalamaili Nature Reserve (KNR), which had a population of 99 in 2012 and 121 in 2013, part of which are semiwild and are returned to the acclimatization pen during the winter. (King et al., 2015)

⁹ https://www.takhi.org/en/takhi/Bestandesentwicklung_en.php

Movements: The collared Przewalski's horses use mainly the northern part of the reserve (GPS data available at International Takhi Group website¹⁰. King and Gurnell (2005) found that home ranges varied between 129 and 2,399 ha, with 80% core areas of between 61 and 1,196 ha.

Importance of transboundary population: The range area Mongolian population is adjacent to the border; movements into China are prevented by the border fence. The reintroduced population in Kalamaili Nature Reserve in China is located far from the border and there is currently no transboundary connectivity between these two populations.



Population development of Przewalski's horse since 1992. Source: International Takhi Group

Asian wild ass:

Population size: Estimate of 5,671 in 2010 in the Jungarian Gobi (Kaczensky et al., 2015a) of Mongolia; about 1,500 khulan according to International Takhi Group in Great Gobi B SPA¹¹. About 5,000 believed to exist in adjacent China (Kaczensky et al., 2015a).

Movements: With the upgrading of the fence along the international border in the 1980s and 1990s, population exchange between Mongolia and China has likely ceased or at least become minimal. Consequently, the Chinese populations should be regarded as separate from Mongolia. (Kaczensky et al., 2015a);

Importance of transboundary population: The population is currently not transboundary. The conservation status in both countries is independent of the potential transboundary character.

Goitered gazelle:

Population size: The Site is part of the larger range area of the species in southern Mongolia. The CAMI Atlas indicates that the range area does not reach into China and the border is the effective range area boundary. No Site-specific information is available.

Movements: No documented transboundary movements known. Regular movements are hindered by the border fence.

Importance of transboundary population: There is currently no functionally transboundary population. The conservation status in Mongolia is independent of the potential transboundary character. However, survival or recovery of the species in the China part of the Site will depend on transboundary connectivity.

Argali:

Population size: The 2009 mountain ungulate survey yielded estimates of approximately 2,311 argali for Khovd (Harris et al., 2010). The Site covers only a small portion of the argali habitat of this aimag and so the argali numbers are much lower. The argali range area in the Site stretches into China but numbers are unknown.

¹⁰ https://www.takhi.org/en/research/takhi_monitoring_en.php

¹¹ https://www.takhi.org/en/research/khulan_monitoring_en.php

Movements: No movement data are known. The border fence may impede transboundary movements.

Importance of transboundary population: It is not known if the population is currently tranboundary. The conservation status in Mongolia is independent of the potential transboundary character, but the Chinese part of the argali population at the site may have little exchange with other argali. Improved connectivity would positively influence the conservation status and improve the genetic diversity of small argali groups and increase chances of recolonization of sites where argali is extinct.

Snow leopard:

Population size: The snow leopard occurs in the Site in Mongolia and reaches into China. No population numbers are known.

Movements: No documented transboundary movements known. Border fences and habitat characteristics limit transboundary movements.

Importance of transboundary population: The patterns of the range area of snow leopard in this regions suggest that the population is transboundary and connectivity across the national border is important for its survival.

Conservation significance:

The Site includes the reintroduction range with currently the largest population of free roaming Przewalski's horses. The potential of future transboundary expansion of their range has driven the inclusion of the species in Appendix I of the CMS. Furthermore is the Site of high significance for the conservation of khulan and has the potential of re-establishing transboundary connectivity between range areas in China and in Mongolia. The Site additionally includes habitat of the target species goitered gazelle, argali and snow leopard.

Protected areas status:

China: Kalamaili Nature Reserve
Mongolia: Great Gobi B SPA

Barriers for migration:

The border fence of China since more than 30 years prevents transboundary movements and connectivity of the target species, possibly except snow leopard.

Other threats:

- Livestock grazing inside and close to the reserve causing forage competition, in particular with khulan and Przewalski's horses;
- Livestock and herders' presence at watering points makes it difficult for khulans to use this essential resource;
- Poaching of khulan as competitors to domestic livestock and source of meat;
- Hybridization of Przewalski's horses with domestic horses.

Given the expanding Przewalski's horse population and the precarious state of khulan outside of Mongolia, protected area management should aim to.

Recommendations for action:

- Severely restriction of grazing of domestic horses and reduction, or at least prevention of any increase in grazing of other livestock and fstudies to better understand pasture competition between the full range of wild and domestic ungulates (Burnik Šturm et al., 2017);
- Creation of transboundary wildlife corridor(s), mainly for khulan and Przewalski's horses but also goitered gazelles, argali and snow leopard.

Site ID: 17

Name: Daurian steppe

Countries: CHN-MNG-RUS

Location:

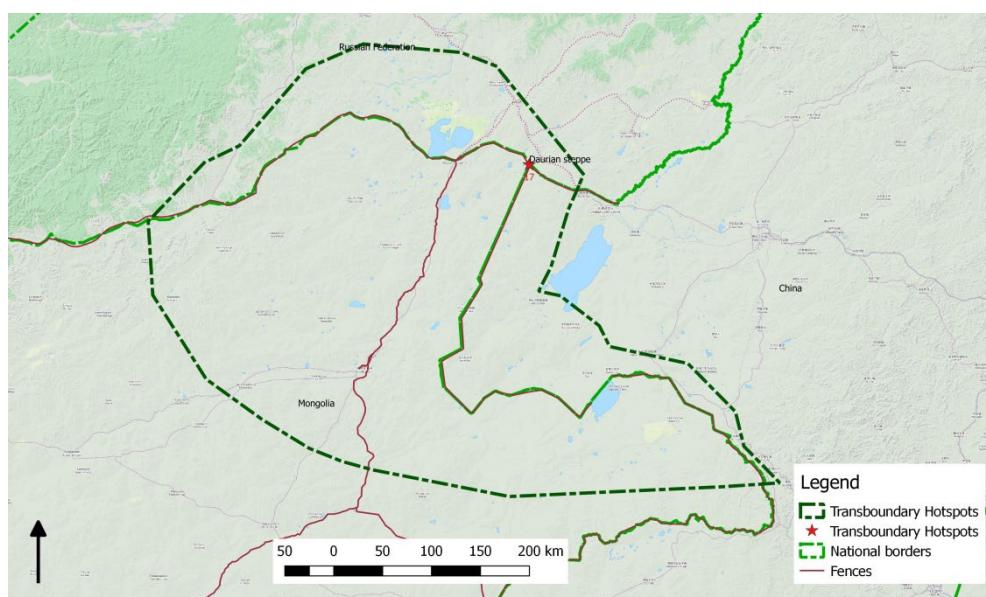
Administrative,

- China, Inner Mongolia, Hulun Buir Prefecture;
- Mongolia, Dornod Aimag;
- Russian Federation, Zabaykalskiy Krai.

Geographic area:

- Daurian steppe.

Coordinates: N 49.844536°, E 116.703908°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Mongolian-Manchurian steppe;

WWF Ecoregion (Olson et al., 2001): Junggar Basin semi-desert;

Desert and semi-desert, small areas with steppe.

Species:

Mongolian gazelle (dzeren):

Population size: Population migrating between Mongolia and Russia: 30-50,000 to 120,000 (3-8% of the world population), much smaller Chinese population separated by border fence much reduced in numbers (IUCN 2015) considered Critically Endangered in the national Red List (IUCN SSC Antelope Specialist Group 2016);

Movements: Mongolian gazelles are seasonally migrating, but movements do not appear to follow a specific pattern and do not show fidelity to any given range. IUCN (2015) notes the last free passage for cross-border migrations of dzeren between Mongolia and Russian Federation, while the CAMI Atlas shows an uninterrupted border fence in the area.;

Importance of transboundary population: Although numerically only small share of the global population, this population is of importance as it inhabits a partly isolated range area. This is the only population of the species, which is transboundary and the Site is the only place where this species breeds in the Russian Federation and maybe also in China (separated by border fence).

Conservation significance:

The Site represents one of the best-preserved examples of Eurasian steppe which supports one of the last truly mass ungulate migrations in Central Asia, that of the Mongolian gazelle (IUCN 2015). It has been inscribed in the UNESCO List of World Heritage Sites as Natural Site in 2017.

Protected areas status:

Mongolia: Mongol Daguur SPA, Yakh Nuur Nature Reserve

Russia: Daurskiy State Biosphere SPA, State natural zakaznik of Federal importance "Dolina dzerena"

Barriers for migration:

There is a border fence from Russia and from the Chinese side. Between Russia and Mongolia there is a border fence west of the Toreysk Lakes (Kirilyuk, pers. comm., 2019). The border fence entangles large numbers of Mongolian gazelles moving in search of quality forage, avoid deep snow, or seek water sources. This also is an obstacle for those gazelles that do not become entangled and therefore their fitness is decreased. The border zone west of Erentsav (RUS-MNG) is apparently passable by gazelles; either there is no fence or it is not a strong barrier there. At the border with China Mongolian gazelles fit with GPS collars appeared to make attempts to cross from the Mongolian side, but were unsuccessful. Also the fenced Ulaanbaatar-Beijing railway line blocks dzeren migration. IUCN (2015) states reports that the fenced Choibalsan-Solovyevsk railway crossing the Site does not prevent migration of Mongolian gazelles.

Other threats:

- Wildfires, which occur more frequently (once or several times a year) than in the past, are caused by human activity, e.g. careless spring agricultural burning, and cause loss of vegetation, soil erosion and habitat degradation;
- Poaching, by IUCN (2015) described as a major threat in the Russian Federation, but in recent years expanded to Mongolia as well. Kirilyuk (pers. comm., 2019) states that effective protection is missing in many Mongolian PAs and there is poaching causing much disturbance, while in Russia poaching is considered insignificant;
- Overgrazing, especially as the traditional nomadic lifestyle of the local people, which sustained natural steppe restoration processes, is being replaced by sedentary living with over 750,000 head of livestock on the Mongolian part (much less in Russia). Overgrazing in Mongolia at the background of droughts causes the depletion of pastures (Kirilyuk pers. comm., 2019);
- In Russia the growing mass migration of dzeren causes growing negative attitudes by local authorities and among the population (Kirilyuk pers. comm., 2019);
- Urban development (China, particularly along border between Nomrog and Erlian);
- Expansion of mining operations.

Existing or planned transboundary activities:

- Transboundary migration of dzeren between Mongolia and Russia is partly protected by the International Russian-Mongolian SPA "Dauriya". (Kirilyuk pers. comm., 2019)
- It is planned to activate the communication between official Russian and Mongolian working groups about the reduction of intensity of transboundary migration of dzeren, which is caused by the pressure on them causing their movement from Mongolia to Russia. (Kirilyuk pers. comm., 2019)

Recommendations for action:

- Regular monitoring of dzeren population in Mongolia is required for effective conservation management.
- Maintenance and improvement of transboundary migration routes through mitigation of fences at the railway and border:

- Modification of the fence so that gazelles are able to pass underneath while still allowing it to serve effective border and railway security;
 - Negotiations ongoing between local environmental authorities and Russian border agencies to reconstruct the fence.
- Important intervention locations:
 - along an east west axis between Erentsaav and Russia/Mongolia/China border (N 49.845169°, E 116.771738° to N 49.885796°, E 115.744532°);
 - between Russia/Mongolia/China border and Kherlen River in the south (N 49.845169°, E 116.771738° to N 48.152085°, E115.521671°);
 - from Kherlen River east to Buir lake (N48.102466°, E115.530399° to N 47.761164°, E 117.493768°), no recent data on gazelles on the China side;
 - from Nomrog west to border town Erlan (N 46.618233°, E 119.602377° to N43.694958°, 111.949712E°), no recent data on gazelles.
- Wildfire control and prevention;
- Hunting ban in key dezeren habitats (Kirilyuk, pers. comm. 2019), anti-poaching, possibly through development of community-based sustainable hunting management (?);
- Better financing of PA management in Mongolia, possibly international assistance is needed (Kirilyuk, pers. comm. 2019);
- Regulation of grazing in key dzeren habitats in the border region (Mongolia, China);
- Restriction of mining activities.

Site ID: 18

Name: Kopet Dagh

Countries: IRN-TKM

Location:

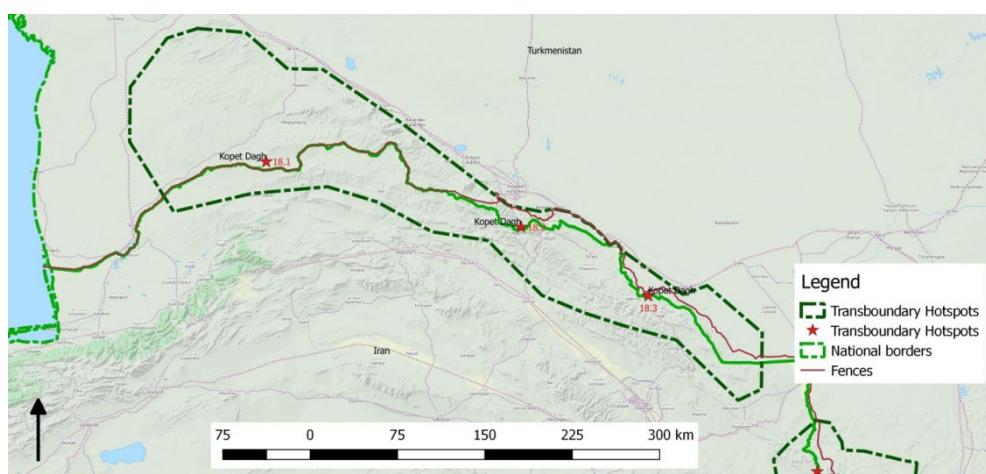
Administrative,

- Iran, Khorasan-e Shomali, Khorasan-e Razavi Provinces;
- Turkmenistan, Dashoguz Welayet (Province);

Geographic area:

- Mountain and hill areas in the entire border region.

Coordinates: N 38.138427°, E 56.020189°; N 37.649680°, E 58.440410°; N 37.131702°, E 59.647731°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Caucaso-Iranian highlands;

WWF Ecoregion (Olson et al., 2001): Kopet Dag woodlands and forest steppe, Kopet Dag semi-desert;

Woodlands, dry steppe and semi-desert.

Species:

Asiatic cheetah

Population size: The species is not present at the site and nearest area of regular occurrence is the Miandasht Wildlife Refuge in north-eastern Iran near, some 150 km from the border with Turkmenistan. Cheetahs are also documented from Touran Biosphere Reserve, west of Miandasht and one cheetah was spotted in 2014 Golestan National Park after 40 years¹². The reliability of the reported spotting of a cheetah in by a local person in the west of the Kopet Dagh Mountains in 2015¹³ remains unclear.

Movements: Closest range area indicated in the CAMI Atlas is 150 km from the Site.

Importance of transboundary population: The establishment of a reproducing transboundary population is extremely unlikely in any foreseeable future. Given the precarious state of the Asiatic cheetah any individual is of importance for the conservation of the subspecies.

Asian wild ass:

Population size:

The Red Book of Turkmenistan in its editions of 1985, 1999 and 2011 mentioned five range area patches of reintroduced kulan with a total population size of 590 individuals. Field

¹² <https://en.mehrnews.com/news/104319/Asiatic-cheetah-ever-spotted-after-40-years>

¹³ <https://blog.nationalgeographic.org/2017/07/09/searching-for-the-last-asiatic-cheetah-on-a-golden-horse/>

research in 2014 -2017 revealed that only two or three patches were still inhabited; with possibly in total only 20 animals (Rustamov pers. comm. 2018). For Iran no reports about wild ass occurrence is available from the Site and the nearest range area is located at 200 km distance from the border. Populations in Iran (*Equus hemionus onager*) and in Turkmenistan (*E.h.kulan*) have been separated for long periods of time and were considered as separate subspecies (Kaczensky et al., 2018).

Movements: No information about the movements of the reintroduced populations is available.

Importance of transboundary population: There has not been a transboundary population at the Site for many decades or even centuries.

Goitered gazelle:

Population size: In Turkmenistan habitats of goitered gazelle exist along the piedmonts of the Kopet Dagh. In the eastern part the population indicated in the red Book had been 1,500, but despite general confirmation of presence in the central and western Kopet Dagh, no data on population size are available (Rustamov, pers. comm. 2018). For Iran no information is available. The nearest possible range area indicated for Iran is 45 km from the range area in Turkmenistan (CAMI Atlas), but occurrence at the Iranian site is very likely (Kaczensky, pers. comm. 2019).

Movements: Between Iran and Turkmenistan border fences from both sides of the border, but Kaczensky, pers. comm. (2019) nevertheless assumes that some transboundary movements happen.

Importance of transboundary population: It is unclear if the species occurs in both countries and if so, if there is connectivity. Possibly a small transboundary population exists in the strip between the border fence of Turkmenistan and the fence in Iran. Any goitered gazelle population would be of high conservation importance because of the risk of local extinction in a wider area. Goitered gazelle is a key prey species for Asiatic cheetah, but also for Persian leopard.

Urial:

Population size: In 2014-2017 the Site had about 1060 urials, which would be less than half of the population size indicated in the Red Book of Turkmenistan. (Rustamov, pers. comm. 2018). The range area covers also areas in Iran. There during a survey the DoE (unpublished, 2016) in protected areas recorded 3,890 (Khorasan-e Shomali) and 7, 269 (Khorasan-e Razavi) urials. What share of these have been recorded within the Site is not known.

Movements: At least a part of the urial population in this area occurs in the border zone, beyond the Turkmenistan border fence and is by all likelihood regularly moving between the countries.

Importance of transboundary population: The population of urial in the Kopet Dagh is among the largest populations of the species and therefore of high conservation importance. Urial is a key prey species for Persian leopard as well as for Asiatic cheetah.

Persian leopard:

Population size: Khorozyan (2008) presented a guesstimate of 78-90 for Turkmenistan, which might be unrealistically high. Sanei et al. (2016) recorded confirmed and possible presence across Iran's Kopet Dagh, with a trend of more confirmed presence records in the western part of the Site. Farhadinia (2016) recorded 21 different leopards, including three leopard moms, across the research areas in Kopet Dagh and nearby located areas.

Movements: Transboundary movements likely despite border fence. The documented cross-border movement of male in 2015 was the first evidence of these movements (Farhadinia, 2016).

Importance of transboundary population: Given the large home ranges and dispersal movements the leopards of this area are part of a larger population. Dispersal of leopards from Iran to Turkmenistan might be support the viability of the population there (Khorozyan, 2008) and transboundary connectivity is of importance for the conservation of the Persian

leopard in this part of its range area, in particular as leopard populations and range areas in Iran become increasingly fragmented (Sanei et al., 2016).

Conservation significance:

The area is of high conservation significance, in particular for Persian leopard, urial and goitered gazelle, but has potential for the recovery of kulan. The Kopet Dagh is this continuum of amazing leopard habitat with the best of protection around Ashgabat and then progressively fading (but no less important!) (Rosen, pers. comm. 2019). Of special importance for goitered gazelle, urial and Persian leopard in Turkmenistan are the large areas beyond the border fence or between the Turkmenistan and Iran fences (Kaczensky, pers. comm. 2019).

Protected areas status:

Iran: Protected areas located within the site and at the border with Turkmenistan or relatively close to it (Darvishsefat, 2006): Tandoureh Protected Area, Tandoureh NP as well as Sarany, Ors-e Sistan, Salouk, Sarigol and Heydari Protected Areas;

Turkmenistan: Central Kopet Dagh SPA

Barriers for migration:

The border fence is continuous along from Turkmenistan side, with areas of varying width between the fence and the actual border. The actual location of the border fence east of Ashghabad is indicated in the revised layer for the CAMI Atlas, while west of the capital the fence is shown schematically along the border. More recently at least in some sections a border fence has as well been erected at the Iranian side, further limiting ungulate movements (Ghoddousi, pers. comm. 2019).

Other threats:

- Poaching is the major threat in the area, less in the areas close to the capital of Turkmenistan;
- Livestock grazing causes forage competition with wild ungulates, habitat degradation and conflict with leopards.

Recommendations for action:

- Transboundary collaboration, particularly on leopard monitoring and conservation;
- Mitigation of border fences to create wildlife corridors and establish connectivity;
- Livestock grazing regulation and enforcement of grazing bans and restrictions in protected areas;
- Prevention and persecution of poaching;
- Conflict mitigation and prevention of killings in the course of conflicts through appropriate measures (e.g. prevention of livestock losses and insurance schemes).

Site ID: 19

Name: Western Kyrgyz Range

Countries: KAZ-KGZ

Location:

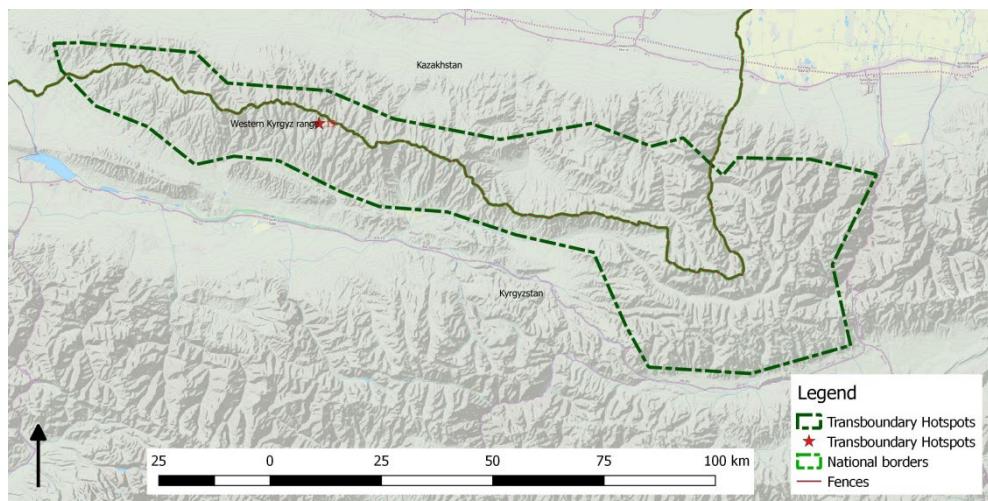
Administrative,

- Kazakhstan, Jambyl Province;
- Kyrgyzstan, Talas Province.

Geographic area:

- Kyrgyz range of Tien Shan.

Coordinates: N 42.718098°, E 72.363159°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir-Tian Shan highlands;

WWF Ecoregion (Olson et al., 2001): Tian Shan montane conifer forests, Tian Shan foothill arid steppe;

Mountain steppe, coniferous forest, woodlands and semi-desert.

Species:

Argali:

Population size: The Site is indicated as range area, but there are few documented recent records. Davletbakov and Musaev (2012) in May 2011 recorded 23 argali in the East of the site.

Movements: No Site-specific information is available.

Importance of transboundary population: The number of argali in the border area by all knowledge is very small, but likely connected with the larger range area of *Ovis ammon karelini*.

Snow leopard:

Population size: Only the east of the Site is indicated in the CAMI Atlas as part of the larger range area of snow leopard in the Tien Shan.

Movements: Snow leopards occurring in the area would move across the border.

Importance of transboundary population: The Site is at the edge of the snow leopard range area. Only its eastern part forms a linking element or stepping stone to other snow leopard ranges areas.

Conservation significance:

The Site most likely is geographically and in terms of population numbers rather marginal for the conservation of the two target species. Its importance lays more in the avoidance of

reduction of overall range areas and there fragmentation, less in the conservation of sizeable populations.

Protected areas status:

None

Barriers for migration:

None

Other threats:

- Poaching;
- Increase in livestock grazing intensity (?).

Recommendations for action:

- Assessment and monitoring: For both target species actual range areas and population sizes as well as connectivity with other parts of their range areas;
- Sustainable game management: The Site is used and has potential as hunting areas, the management of which has to be improved and where suitable community-based wildlife management areas might be developed;
- Regulation of livestock grazing and conflict reduction: Impact of livestock grazing and intensity of conflict need to be assessed and if needed interventions should be developed.

Site ID: 20

Name: Northern Tien Shan

Countries: KAZ-KGZ

Location:

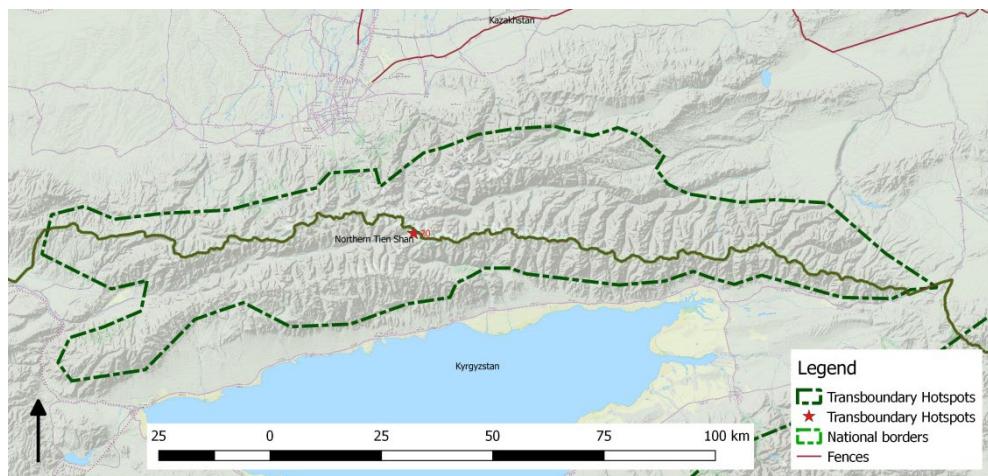
Administrative,

- Kazakhstan, Almaty Province;
- Kyrgyzstan, Issyk-Köl and Chuy Provinces.

Geographic area:

- Zaili-Alatau and Kungey-Alatau ranges of Tien Shan.

Coordinates: N 42.927080°, E 77.195160°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir-Tian Shan highlands;

WWF Ecoregion (Olson et al., 2001): Tian Shan montane steppe, Tian Shan montane conifer forests, Tian Shan foothill arid steppe;

Mountain steppe and meadows, coniferous forest, woodlands.

Species:

Argali:

Population size: The Site is indicated as part of the range area, although there are few known observations (e.g. unpublished Michel in 2004 at eastern edge). The area of suitable habitat seems limited and the population size is likely small.

Movements: Michel (unpublished) observed in 2004 one female argali moving across the undulating plateau across the state border at the eastern edge of the Site.

Importance of transboundary population: Given the limited suitable habitat any argali population in the area can only be conserved and managed as transboundary population. The Site is likely used only by a tiny portion of the overall population of argali in the Tien Shan and is less important than the areas and population south of Issyk-Köl lake.

Snow leopard:

Population size: Snow leopard presence has been repeatedly recorded in different parts of the Site and in both countries, e.g. 2014-2015 two individuals in Ile-Alatau NP and six individuals in Kolsay-Kolderi NP (ACBK 2016). The Site has a reproducing population. The population size in the Zaili-Alatau range was guessed at 30-35 in the early 2000s (ACBK 2016). Lukarevskiy and Umetbekov (2011) assumed there are 10-15 snow leopards in the Kungey Alatau at the Kyrgyzstan part of the Site.

Movements: So far no systematic study of movements took place, but the topography of the site makes long distance movements and regular crossing of the state border likely.

Importance of transboundary population: The range area of this snow leopard stretches along the state border and so the entire population in the Northern Tien Shan is transboundary.

Conservation significance:

The Site is the home range of one important snow leopard population and covers the most significant of the GSLEP Landscape Northern Tien Shan.

Protected areas status:

Kazakhstan: Almaty SPA, Ile-Alatau National Park, Kolsai-Kolderi National Park;

Kyrgyzstan: Chon-Kemin National Park

Barriers for migration:

The CAMI Atlas indicates a border fence. However, this fence may exist only in certain sections or not at all.

Other threats:

- Poaching;
- Intensive and unregulated tourism development: This includes the development of a ski resort in the area of Ile-Alatau National Park, for which the park area has been reduced and which will have massive impact also on the remaining park area;
- Livestock: Increase of livestock numbers and poorly regulated grazing (locally).

Existing or planned transboundary activities:

- German government funded transboundary project, implemented by NABU 2014-2016 (?), follow-up project considered.

Recommendations for action:

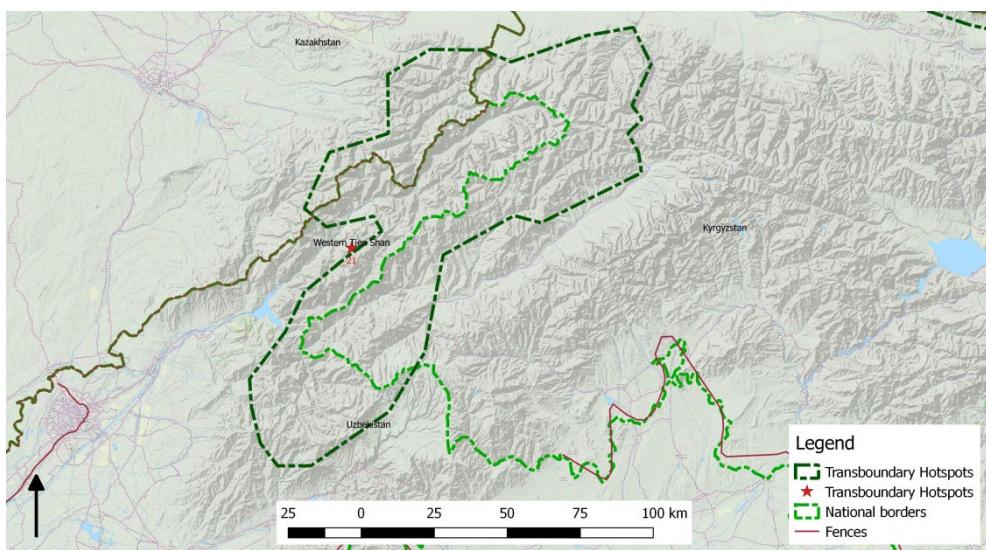
- Improved transboundary collaboration between protected areas, scientific organizations and NGOs in monitoring, research, conservation management and regulation of transboundary development;
- Better regulation of tourism, no tourism development causing substantial transformation of landscapes and ecotourism;
- Development of community-based wildlife management to prevent poaching and incentivize wildlife over livestock;
- Expansion and consolidation of zones without livestock grazing.

Location:*Administrative,*

- Kazakhstan, Jambyl and South Kazakhstan Provinces;
- Kyrgyzstan, Talas Province;
- Uzbekistan, Tashkent Province.

Geographic area:

- Mountain ranges of western Tien Shan.

Coordinates: N 41.824316°, E 70.385352°**Biogeographical region; major ecosystems/habitat types:**

Udvardy 1982: Pamir-Tian Shan highlands;

WWF Ecoregion (Olson et al., 2001): Tian Shan montane steppe, Tian Shan foothill arid steppe, Gissaro-Alai open woodlands;

Mountain steppe and meadows, deciduous and juniper forest and woodlands.

Species:***Argali:***

Population size: The Site is indicated as partly within the range area. Argali numbers in Aksu-Zhabagly SPA were below 100 in the early 2000s and had declined the decades before (Shakula, pers. comm. 2004). According to the Nomination Dossier (2016) argali occurs in the protected areas Aksu-Jabagly, Sairam-Ugam and Besh-Aral. Argali is not confirmed from Uzbekistan for the recent decades. The area of suitable habitat seems limited and the population size is likely small.

Movements: There are unconfirmed reports about past or current seasonal migrations of argali between the Western Tien Shan and its north-western spur, the Syrdarya Karatau. The population is using transboundary habitats between Kazakhstan and Kyrgyzstan.

Importance of transboundary population: The argali population is the most north-western of *Ovis ammon karelini* and is spatially close to the rare Karatau argali *O.a.nigrimontana*.

Snow leopard:

Population size: Snow leopard presence is reported from all parts of the Site (Nomination Dossier 2016). For Uzbekistan varying figures of 10–15 (or 30–40) individuals have been presented (Nyhus et al., 2016). These snow leopards would in any case roam beyond the

borders of the country and these figures may rather represent the overall population of the Site.

Movements: Due to the mountainous topography snow leopards regularly move between the parts of the Site belonging to the three countries.

Importance of transboundary population: This snow leopard population is generally transboundary and can only be preserved as one unit. It is assumed that the snow leopards of the Site are part of a larger range area stretching into the Kyrgyz Range. This population may have limited connectivity with other snow leopard populations and is therefore prone to further fragmentation and decline.

Conservation significance:

The area is of significance for the conservation of the most north-western range area patches and population of Tien Shan argali and for the snow leopard. Sections of the Site have been inscribed on the World Heritage List of natural sites on the basis of criterion (X), i.e. because of its outstanding biodiversity value. Snow leopard and argali are explicitly mentioned in the decision about the inscription (Decision: 40 COM 8B.9 of the World Heritage Committee in 2016).

Protected areas status:

Kazakhstan: Aksu-Zhabagly SPA; Sairam-Ugam State National Natural Park

Kyrgyzstan: Besh Aral SPA;

Uzbekistan: Chatkal SPA, Ugam-Chatkal BR, Ugam-Chatkal NP.

Barriers for migration:

The CAMI Atlas shows a partial border fence of unknown characteristics between Kazakhstan and the other two countries. No border fences are known in the Site.

Other threats:

- Poaching: Differences in wildlife populations and behaviour, particularly of ibex between a well-managed hunting area in Uzbekistan and adjacent areas suggest that poaching is a major limiting factor for ungulates and the snow leopard depending on them;
- Livestock grazing: In several parts overly intensive livestock grazing is a cause of competition with wild ungulates, habitat degradation, disturbance and conflict. Livestock grazing permits are the main source of income of several forestry units, including the unit in charge Ugam-Chatkal NP;
- Tourism development: Due to its locally concentrated character, tourism development does not seem to be a major threat. Guided tourism in Aksu-Zhabagly SPA did not lead to obvious conservation issues for the target species and their ecosystems.

Existing or planned transboundary activities:

- GEF-funded UNDP projects are currently implemented in Kyrgyzstan and Uzbekistan for improved landscape level conservation.

Recommendations for action:

- Intensified monitoring of the target species;
- Collaboration across borders on monitoring, conservation activities and tourism development;
- Intensified anti-poaching in and beyond protected areas, including the development of sustainable hunting management;
- Training of PA staff, in particular on work with the public, law enforcement and monitoring;
- Feasibility assessment of proposed argali reintroduction in the Uzbekistan part of the Site.

Site ID: 22

Name: Ural Steppe

Countries: KAZ-RUS

Location:

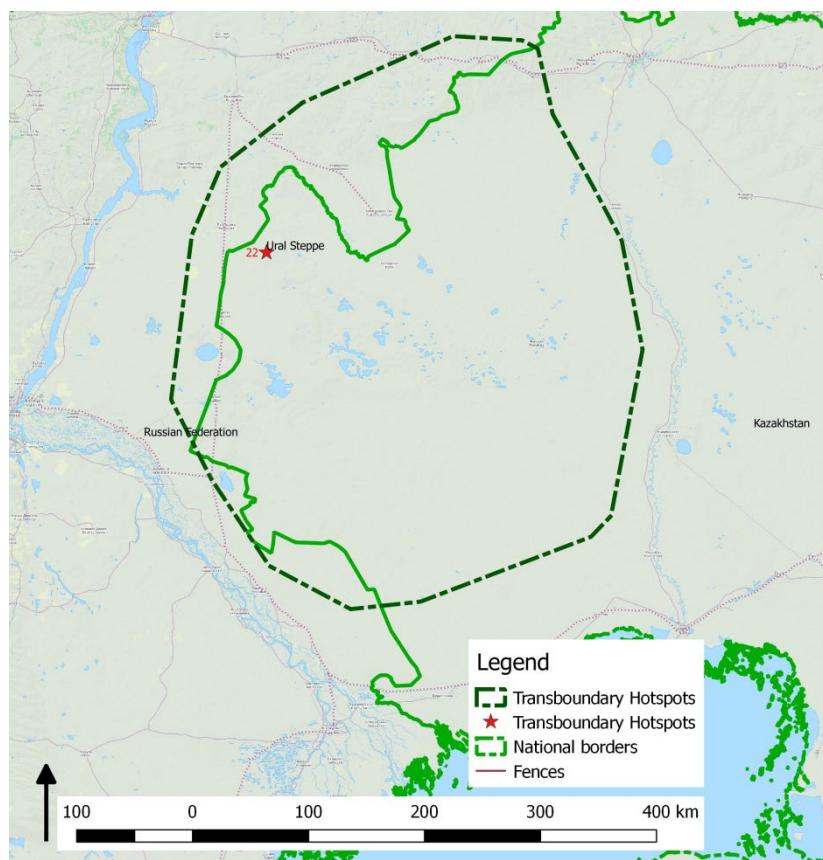
Administrative,

- Kazakhstan, West Kazakhstan Province;
- Russia, Astrakhan, Volgograd and Saratov Provinces.

Geographic area:

- Range area of Volga-Ural population of saiga antelope.

Coordinates: N 49.860873°, E 47.331539°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pontian steppe, Turanian;

WWF Ecoregion (Olson et al., 2001): Pontic steppe, Caspian lowland desert; Steppe, semi-desert, arable lands.

Species:

Saiga antelope:

Population size: The Volga-Ural saiga population experienced massive fluctuations during the last decades. The population went down to few thousand in the early 2000s due to massive poaching and related reproductive collapse. The recovery was interrupted by a mass die-off in 2010, causing the loss of about half of the population of that time. Since then the numbers recovered and in spring 2019 with an estimated 217,000 individuals it was the largest saiga population globally.

Movements: The saigas seasonally migrate within their range area, with winter habitat in the south and summer habitat further to the north. The length of the border, where saiga cross-

border movements are possible, is up to 1000 km. The recently installed border fence impedes these movements.

Importance of transboundary population: The population is in a large extent potentially transboundary. With the recovery of the population more and more saigas seasonally migrate from Kazakhstan into Russia. In 2018 single saigas as well as herds of several thousand animals have been observed. (Mezhnev, presentation 2019). The actual portion of the population crossing the border is not known, but transboundary migration becomes increasingly important as the population recovers.

Conservation significance:

The saiga population of the Site is currently the largest population globally and continues to recover. Its conservation is thus of global significance.

Protected areas status:

Russia: Bogdinsko-Baskunchakskiy SPA, Bogdinsko-Baskunchakskiy *Zakaznik*

Barriers for migration:

On a part of the length of the Russian-Kazakhstan border in the area of the Volga-Ural population (Astrakhan, Volgograd, and Saratov regions of the Russian Federation), on the initiative of the veterinary services, a barbed wire fence was installed that impede the movement of saigas. The railroad Saratov-Astrakhan along the national border presents another obstacle to saiga movements. The barriers for migration impede the access of saiga to critical seasonal habitat, in particular during times of limited access to forage caused by snow and ice (*dzhut*) or drought.

Other threats:

- Poaching: focused mainly on males for selling horns for smuggling abroad;
- Conflict with farmers/herders: According to media reports (June 2019¹⁴) large saiga herds are perceived by local land-users as damaging “pastures” and attempts have been made by them to chase off the animals from their lands.

Existing or planned transboundary activities:

- Interaction of saiga conservation inspections;
- Borderline PAs of federal and regional importance (planned)
- Agreement between the Ministry of Natural Resources and Environment of the Russian Federation and the Ministry of Agriculture of the Republic of Kazakhstan on the protection, reproduction and use of the Volga-Ural saiga group.

Recommendations for action:

- Strengthen the fight against poaching;
- Creation of transboundary protected areas;
- Mapping of fences and assessment of their impact on saiga populations;
- Adaptation of the fences to make it possible for saigas to cross them;
- Sustainable use options benefiting local land users and making them responsible for saiga conservation should be explored to create local ownership, prevent the development of negative perceptions about saigas and ensure local support saiga conservation and anti-poaching in particular.

¹⁴ <https://ru.sputniknews.kz/regions/20190604/10371274/zapad-kazakhstan-nashestviye-saygak.html>; <https://newsland.com/user/3759557959/content/selchane-zapadnogo-kazakhstana-zhaluiutsia-na-nashestvie-saygakov/6767891>; <https://turantimes.kz/video/6362-nashestvie-saygakov-v-zko-zhivotnye-unichtozhayut-urozhay.html>

Site ID: 23

Name: Northern Betpakdala

Countries: KAZ-RUS

Location:

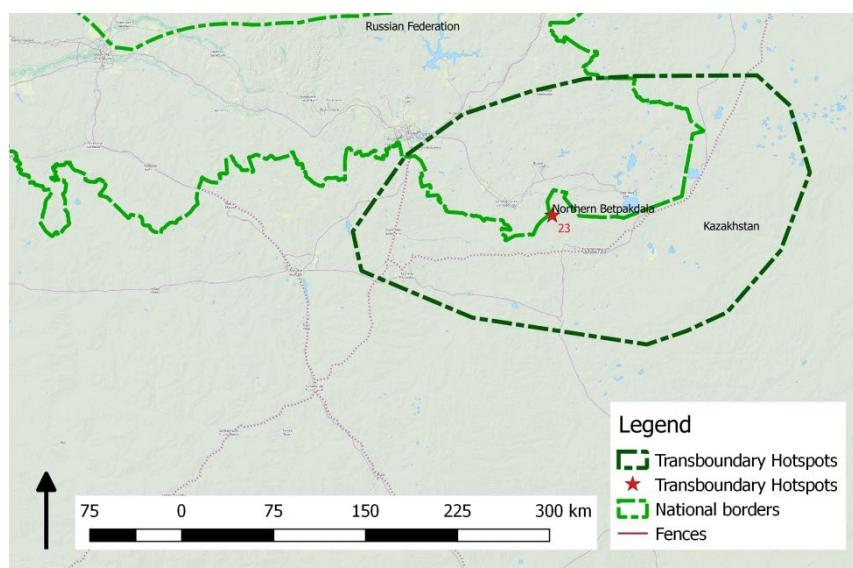
Administrative,

- Kazakhstan, Aqtobe and Kostanay Provinces;
- Russia, Orenburg Province.

Geographic area:

- Northern edges of range area of Betpakdala population of saiga.

Coordinates: N 50.673074°, E 60.027631°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pontian steppe;

WWF Ecoregion (Olson et al., 2001): Kazakh steppe, Kazakh forest steppe, Kazakh semi-desert;

Steppe, semi-desert, arable lands.

Species:

Saiga antelope:

Population size: The Betpak-Dala saiga population experienced massive fluctuations during the last decades. The population went down to few thousand in the early 2000s due to massive poaching and related reproductive collapse. The recovery was interrupted by a mass die-off in 2015, causing the loss of more than 200,000 saigas or about 85% of the population of that time. Since then the numbers recovered and in spring 2019 with an estimated 111,500 individuals it was the second largest saiga population globally.

Movements: The saigas seasonally migrate within their range area, with winter habitat in the south and summer habitat further to the north. As most of the saiga range is within Kazakhstan there are only occasional movements into Russia. The recently installed border fence impedes these movements.

Importance of transboundary population: The population is only in very minor extent potentially transboundary. With the recovery of the population more saigas may seasonally try to migrate from Kazakhstan into Russia. If climate change causes more arid conditions this may enforce such migrations during summer in search of better forage conditions. In 2018 only single saigas observed in the Russian part of the site, which has been attributed to the border fence (Mezhnev, presentation 2019).

Conservation significance:

The saiga population of the Site in the past has been the largest population globally and continues to recover. Its conservation is thus of global significance. Cross-border migration is currently not essential for the conservation of this population, but it may contribute to the recovery of numbers, expansion of range area and increase the resilience of the population against various events (e.g., disease, forage shortage).

Protected areas status:

Kazakhstan: Tounsortsiy Zakaznik

Russia: One section of "Orenburgskiy" SPA

Barriers for migration:

On a part of the length of the Russian-Kazakhstan border in the area of the Betpak-dala population (Orenburg region of the Russian Federation), on the initiative of the veterinary services, a barbed wire fence was installed that impede the movement of saigas. The railroad Saratov-Astrakhan along the national border presents another obstacle to saiga movements. The barriers for migration impede the access of saiga to critical seasonal habitat, in particular during times of limited access to forage caused by snow and ice (*dzhut*) or drought.

Other threats:

- Poaching: focused mainly on males for selling horns for smuggling abroad;
- Conflict with farmers/herders: So far not reported from the area, but saiga damage on arable fields had been an issue during Soviet times and was one of the drivers of saiga culling.

Existing or planned transboundary activities:

- Interaction of saiga conservation inspections;
- Borderline PAs of federal and regional importance (planned)
- Agreement between the Ministry of Natural Resources and Environment of the Russian Federation and the Ministry of Agriculture of the Republic of Kazakhstan on the protection, reproduction and use of the Volga-Ural saiga group (planned to be extended to the Betpak-dala population).

Recommendations for action:

- Strengthen the fight against poaching;
- Creation of transboundary protected areas;
- Mapping of fences and assessment of their impact on saiga populations;
- Adaptation of the fences to make it possible for saigas to cross them;
- Sustainable use options benefiting local land users and making them responsible for saiga conservation should be explored to create local ownership, prevent the development of negative perceptions about saigas and ensure local support saiga conservation and anti-poaching in particular.

Site ID: 24

Name: South-western Ustyurt

Countries: KAZ-TKM

Location:

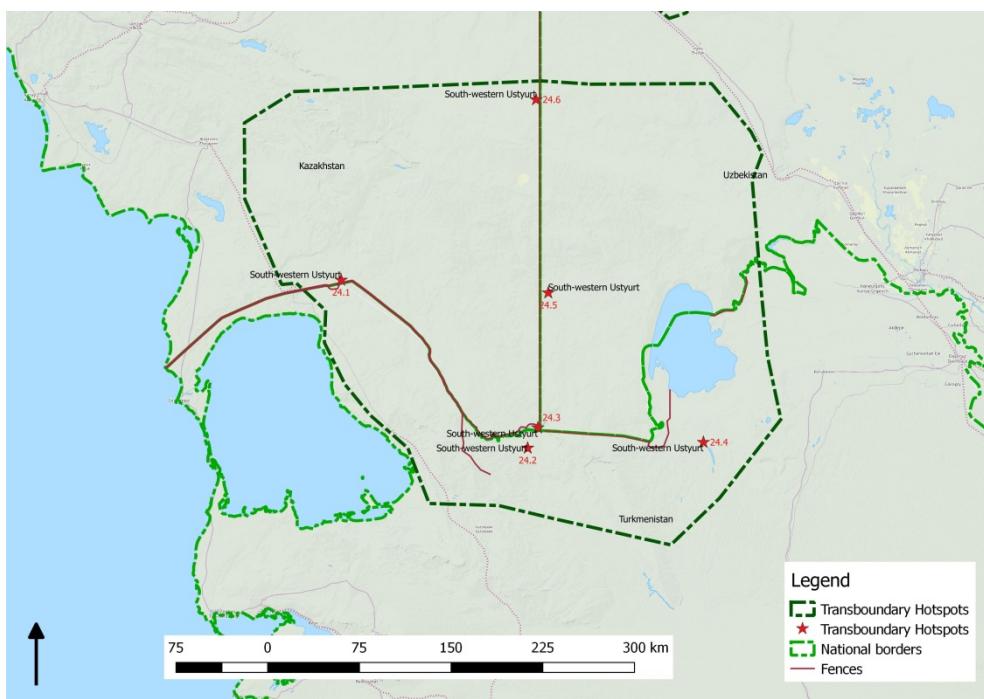
Administrative,

- Kazakhstan, Mangystau Province;
- Turkmenistan, Balkan Province;
- Uzbekistan, Karakalpakstan Autonomous Republic.

Geographic area:

- Ustyurt SPA and areas south of it (1);
- Kaplanyr Plateau south east of salt pan (*shor*) (2);
- Chink at the border, Kazakhly shor (3);
- Kaplanyr SPA s of Sarygamysh lake (4);
- Assake-Audan (5);
- Areas south of the road Barsa Kelmes – Jaslyk and between KAZ-UZB border and Ustyurt SPA (6).

Coordinates: N 42.382329°, E 54.111493°(1); N 41.194460°, E 55.881960°(2); N 41.338580°, E 55.978608°(3); N 41.235781°, E 57.550095° (4?); N 42.293289°, E 56.077211°(5); N 43.634792°, E 55.961138° (6)



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Turanian;

WWF Ecoregion (Olson et al., 2001): Central Asian northern desert, Central Asian southern desert;

Steppe, semi-desert, arable lands.

Species:

Asiatic wild ass:

Population size: Kazakhstan: Kulan is considered extinct in Mangystau since the late 19th/early 20th century (Heptner et al., 1961/1988). There had been twice attempts of

reintroducing the species, which both failed, apparently because of poaching. One kulan was observed by ACBK researchers near the border with Uzbekistan, close to the site Assake-Audan (5) in April 2019¹⁵. This is the first confirmed kulan in Mangystau record for many years. Turkmenistan: The wild ass population of the Site has been reintroduced in the 1980s and may have reached more than 200 individuals in the early 2000s (Rustamov et al., 2015). But expeditions in 2014-2017 revealed a massive decline and loss of range area with a maximum number of 80 individuals (Rustamov pers. comm. 2018). In Uzbekistan kulan has been recorded between Sarykamysh Lake and the borders with Turkmenistan and Kazakhstan, in the Assake Audan depression and at the Kazakhly Shor cliff (*chink*), as well as in the north and west of Sarykamysh (Marmazinskaya et al., 2013).

Movements: Kulan are highly mobile and move long distances, in particular to access water. At the Site movements are massively hampered by border fences. Sites without border fences mostly are salt swamps or have steep terrain and allow movements only during dry seasons or at few locations.

Importance of transboundary population: Despite the massive movement restrictions and the limited range area the Asiatic wild ass population of the Site has to be considered entirely transboundary. Given the precarious state of Asiatic wild ass outside of Mongolia and of this subspecies in particular, any population is of high conservation significance. Transboundary mobility and connectivity of habitats are essentials for the survival of this population.

Goitered gazelle:

Population size: In the Kazakhstan part of the Site goitered gazelle is widespread and has a stronghold in Ustyurt SPA and adjacent areas. In Turkmenistan the Red Book previously stated a population of 1700 gazelles for the area, but expeditions in 2014-2017 confirmed only about 300 animals (Rustamov, pers. comm. 2018). In Uzbekistan expeditions under the CADI project confirmed presence of goitered gazelle from the entire area between Sarykamysh Lake and the borders with Turkmenistan and Kazakhstan, as well as further to the north (Wunderlich, pers. comm. 2019, Marmazinskaya et al., 2012). Goitered gazelle occurs in low density, with in total maybe 150 animals only (Marmazinskaya, pers. comm. 2019), although this statement may refer to parts of the Site only.

Movements: Goitered gazelles are very mobile. Their migrations are affected by the border fences, which also are a reason of direct mortality.

Importance of transboundary population: The population is currently only partly transboundary as the border fences have caused an effective fragmentation. Transboundary connectivity is essential for the maintenance of genetic diversity, sufficient effective population size to preserve a viable population and for access to habitats of seasonally varying suitability.

Urial:

Population size: Urial occurs in Kazakhstan in Ustyurt SPA as well as in other areas with suitable relief. Ismailov (pers. comm. 2019) assessed the overall population of the Site in Kazakhstan with 700-750 and assumes a 50% decline since the early 2000s. In Turkmenistan Rustamov (pers. comm. 2018) found a decline to 250 animals during expeditions 2014-2017, compared to up to 1,600 animals indicated for the 1990s in editions of the Red Book. In Uzbekistan CADI expeditions (2012-2014, Wunderlich, pers. comm. 2019) recorded urial observations, tracks and skulls north of Kazakhly Shor (3), northwest of Kaplankyr SPA (near 4), along the western shore of Sarykamysh Lake and northwest of it. Overall numbers are apparently very low (Marmazinskaya et al., 2012).

Movements: Urials move between sites with suitable relief and can cross plain areas of several tens of kilometres. Pestov (pers. comm., 2019) mentioned that urial in contrast to other ungulates are able to pass the barbed-wire border fences established from Kazakhstan without obvious difficulties or harm. The Turkmenistan border fence of covered chain-link cannot be crossed by urials, but there might still be areas where urials can bypass the fence.

¹⁵ Facebook post by ACBK, May 2, 2019.

Importance of transboundary population: The patchy distribution of suitable habitats, the small size and carrying capacity of many of these habitat patches and low overall numbers make the urial population's long-term survival highly dependent on transboundary connectivity.

Persian leopard:

Population size: The Site is so far not considered as permanent range area of the leopard in any of the countries. During the last two decades three leopards have been recorded in Mangystau Province, in the Kazakhstan part of the Site or close to it. In fall and winter 2018 a leopard was repeatedly recorded on camera traps in Ustyurt SPA in Kazakhstan. The closest known occurrence has been in the Great Balkhan in Turkmenistan, where tracks and remains of dead leopards were found in 2017 (about 370 km). The distance to the western Kopet Dagh in southern Turkmenistan, where the leopard lives at present, is at least 600 km. Two more leopards were killed in Mangystau region in 2007 and 2015. (Pestov et al., 2019) Marmazinskaya (pers. comm. 2018) reported that she had observed possible leopard tracks in the Uzbekistan part of the Site.

Movements: Dispersing leopards, mainly males, can walk distances of several hundred kilometres in search of new home ranges. If these can establish new population nuclei depends on the dispersal of females, which are much less mobile, into such areas.

Importance of transboundary population: So far the occurrence of single dispersing males does not yet form a transboundary population. These leopards are nevertheless important as they can indicate the habitat suitability for the species and may in the long run become the colonizers of new areas if reproducing females reach such places naturally or assisted.

Saiga antelope:

Population size: The Site has in the past been part of the range area of the Ustyurt population and still in winter 1993-1994 25,000 saigas migrated to the Turkmenistan part of the Site. With the rapid decline of this population only single saiga observations were recorded in the area since that time, in Turkmenistan latest in winter 2008-2009. CADI expeditions in 2012-2014 recorded saiga skulls in the Uzbekistan part of the Site, west of Sarykamysh Lake (Marmazinskaya et al, 2012, Murzakhanov, pers. comm. 2019).

Movements: In the past the Site has been the winter range for a part of the Ustyurt population and saigas depending on the weather conditions migrated southwards beyond the border of Turkmenistan.

Importance of transboundary population: Currently the range area of the remaining Ustyurt population is too far away to make saiga migration to the Site likely. If the recovery of this population will also allow for the recolonization of range areas south-west of the Beyneu-Nukus road and railway cannot yet be predicted.

Conservation significance:

The Site is of high significance for the conservation of at least three target species – Asian wild ass (kulon), goitered gazelle and urial. The latter two species have declining but still substantial population sizes. The status of kulon appears highly critical, but compared with several other populations in Turkmenistan at the brink of extinction there is still a comparably high chance of survival of the species in the Site. For leopard and saiga antelope the area may become important under the most optimistic assumptions. .

Protected areas status:

Kazakhstan: Ustyurt SPA; Kenderli Kayasanskaya Protected Zone;

Turkmenistan: Kaplankyr SPA, Sarykamysh Zakaznik, Shasenem Zakaznik;

Uzbekistan: Planned Southern Ustyurt SPA.

Barriers for migration:

Border fences: There is a border fence from Kazakhstan (chain-link) along the entire border of the country. At the section towards Turkmenistan several openings exist. From the Turkmenistan side the border fence is made from chain-link and covered by several lines of

barbed wire, but there are still areas at Sarykamysh Lake without border fences, where animals can cross at least seasonally. There is no fence from the side of Uzbekistan. The fences cannot be crossed by goitered gazelle and kulan; urials can reportedly pass the Kazakhstan fence, but not the Turkmenistan fence (Pestov, pers. comm. 2019). Border guards reported that they had observed gazelles, which got injured and died as results of crossing attempts (Pestov, pers. comm. 2019). Furthermore, openings in the border fence from Kazakhstan to facilitate wildlife migration and the open section of the border fence from the Turkmenistan side reportedly allow gazelles and possibly kulan to move into the area between the fences. In most sections the fences are only few hundred meters or less apart. Wildlife within this strip cannot escape to either side in the case of motorized border patrols and might be chased or jump into the fences, causing death or injuries.

Karashor lake (Altyn asyr): This planned artificial lake (N 40.826509° E 56.705714°) might become another barrier for wildlife movements and may have indirect negative impact. But there is currently not as much water available to flood the area.

Other threats:

- Poaching: Despite low human population poaching is a serious threat to all target species across the Site. Cross-border poaching takes place. Turkmenistan border guards poaching with search lights have been observed in Uzbekistan in the mid 2010-s (anonymous source, pers. comm. 2018). The rapid declines of kulan, goitered gazelles and urial in Turkmenistan can mainly be explained by poaching (Rustamov et al., 2015).
- Fishery: At Sarykamysh lake fishes are intensively harvested, which causes disturbance.
- Oil and gas industries: Exploration and extraction are a threat to the target species through disturbance, habitat degradation and direct persecution by staff of the companies. Exploration of gas fields adjacent to Ustyurt Zapovednik in 2015/2016 reportedly caused an immediate (temporary?) decline of goitered gazelle and urial numbers due to disturbance (Pestov, SPA staff, pers. comm. 2016). In 2019 the company KazMunayGaz stated that the gas field will not be exploited.

Recommendations for action:

- Cross-border collaboration at expert and political level: Coordinated assessments and monitoring, exchange of information, lobbying of border security authorities and their collaboration;
- Modification of border fence in Kazakhstan: Based on the experience from Eastern Ustyurt the responsible border authority shall be lobbied to modify the border fence with sufficiently large openings and underpasses. Along the border with Turkmenistan such modifications need to be sufficiently frequent to allow animals escape from the strip between the fences of the two countries.
- Lobbying with Government of Turkmenistan and border authorities: The government should be further encouraged to join CMS and to implement measures for mitigation of the border fence in the context of improving the country's international reputation. Focus should be (Rustamov et al., 2015) on the junction of the borders of the three countries and the Sarykamysh depression as well as Kazakhly Shor, Kara Shor and the area Kulantakyr, located in between and showing in its name previous occurrence of Asiatic wild ass.
- Anti-poaching: Enforcement of wildlife protection is difficult in this remote area and requires an increase in staff, involvement of local people, and work with border police in the three countries. Approaches of involvement of hunters interested in sustainable hunting opportunities and assignment of hunting grounds should be explored.

Site ID: 25

Name: Eastern Ustyurt

Countries: KAZ-UZB

Location:

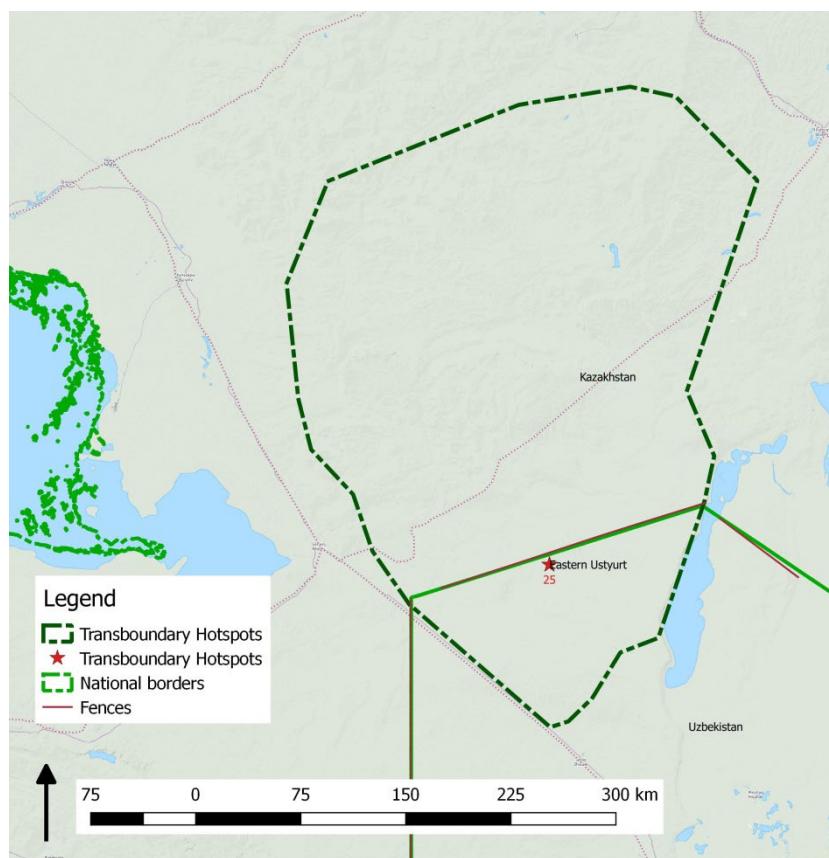
Administrative,

- Kazakhstan, Mangystau, Atyrau (?) and Aqtobe Provinces;
- Uzbekistan, Karakalpakstan Autonomous Republic.

Geographic area:

- Range area of Ustyurt population of saiga
- Ustyurt between Atyrau-Nukus road and Aral Sea shore.

Coordinates: N 45.207123°, E 57.217359°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Turanian;

WWF Ecoregion (Olson et al., 2001): Central Asian northern desert;
Semi-desert, desert, steppe, mud and salt pans (*takyr* and *shor*).

Species:

Goitered gazelle:

Population size: In the Kazakhstan part of the Site the goitered gazelle is according to various reports by local extinct since a cold and snowy winter around 1993 and did not recolonize the area (various statements to Kozybakov and Michel 2015-2019). Occurrence of goitered gazelles in the Uzbekistan part needs to be verified.

Movements: Despite the high mobility of the species no movements into Kazakhstan are known for the last decades.

Importance of transboundary population: There is currently no known transboundary population in the Site.

Saiga antelope:

Population size: The Ustyurt saiga population experienced a continuous and massive decline during the last decades. The population went down from about 254.000 in the early 1990s to an estimated 1,270 in 2015 due to massive poaching and possibly the impact of new barriers to migration. Since then the numbers seem to recover. In spring 2019 with an estimated 5,900 individuals it still belonged to the smallest saiga population globally. In the Uzbekistan part of the range area of the Ustyurt population saiga observations declined since the erection of the border fence and almost ceased since the construction of the new railway, i.e. since 2013.

Movements: The saigas seasonally migrate within their range area, with winter habitat in the south and summer habitat further to the north. After the construction of the border fence still movements of saiga into Uzbekistan were recorded. Currently most of the saiga range is within Kazakhstan north of the railway and so far no crossings of this barrier have been documented (Zuther and Salemgareyev, pers. comm 2019). During saiga transects census survey in Uzbekistan in December 2017 were recorded only saiga tracks, in comparison with the same period of 2016, when saigas were seen on the same transects. In February 2019 saigas and even their tracks in the snow were not found. (Zuther, Salemgareyev, Bykova pers. comm. 2019) There might only occasional movements into Uzbekistan if there is still a small group of saiga existing south of the new railway.

Importance of transboundary population: The population had always been transboundary with substantial parts of the winter range being located in Uzbekistan. Currently these migrations ceased, which can be attributed to the combined impact of the new railway and low saiga numbers. However, the transboundary migrations are essential for the long-term viability of the population. In the case of severe winters high losses are possible if saiga cannot access southern winter ranges. Also for the recovery of the population arecolonization of transboundary range areas will likely be of importance.

Conservation significance:

The saiga population of the Site has in the past been globally significant. It is currently in a critical stage but seems to recover. As one out of four populations of *Saiga tatarica* its conservation is of global significance. Cross-border migration does currently not happen, but is likely essential for the conservation of this population.

Protected areas status:

Uzbekistan: Saigachy Zakaznik

Barriers for migration:

- Border fence from the side of Kazakhstan (erected 2011); In 2015, the design of the fence was modified based on the recommendations by K. Olson (2013) - passages for migration were opened in 125 sections of the 150 km border fence. Up to now, no data exists on the effectiveness of such passages, especially in a period with high levels of snow.
- New railway Shalkar-Beyneu (built 2012-2014, used since 2015) became a serious barrier for the movements of saiga to the south during migration. According to ground and aerial monitoring, since 2016 no saigas have been observed south of the railway (Zuther, Salemgareyev, Bykova pers. comm. 2019). The railway is currently avoided by saiga antelopes, but by its constructive features possible to be passed, function of special overpasses doubtful.

Other threats:

- Poaching: mainly opportunistically for meat, less focused on males for selling horns.

Existing or planned transboundary activities:

- Agreement between Kazakhstan and Uzbekistan since 2010, but dormant.

Recommendations for action:

- Strengthen the work on bilateral cooperation between Kazakhstan and Uzbekistan within the framework of the cooperation agreement signed in 2010;
- Strengthen the fight against poaching;
- Continuous monitoring of saiga population trends, movements and impact of railway and border fence and evaluate existing mitigation measures (at both railway and fence) and continue/expand saiga satellite tracking;
- If necessary, adaptation of railway overpasses, temporary traffic stops for the railway (at nighttime) and turning off light along the railway and further modification of the fences to ease crossing by saigas;
- Lobby for the creation of a migration corridor or other protected area in Kazakhstan, addressing as well safe crossings of the railway and the border fence.
- Development of community-based saiga conservation across the population's range area with the perspective of sustainable use options benefiting local land users and making them responsible for saiga conservation.
- Strengthen the efficiency of the Saigachiyl wildlife reserve (e.g. organizing well-protected watering places, installing additional street signs indicating borders of the reserve, working with local people, interacting with law enforcement agencies, cross-border cooperation).
- Organise transboundary rangers meeting, including involvement of community rangers.

Location:

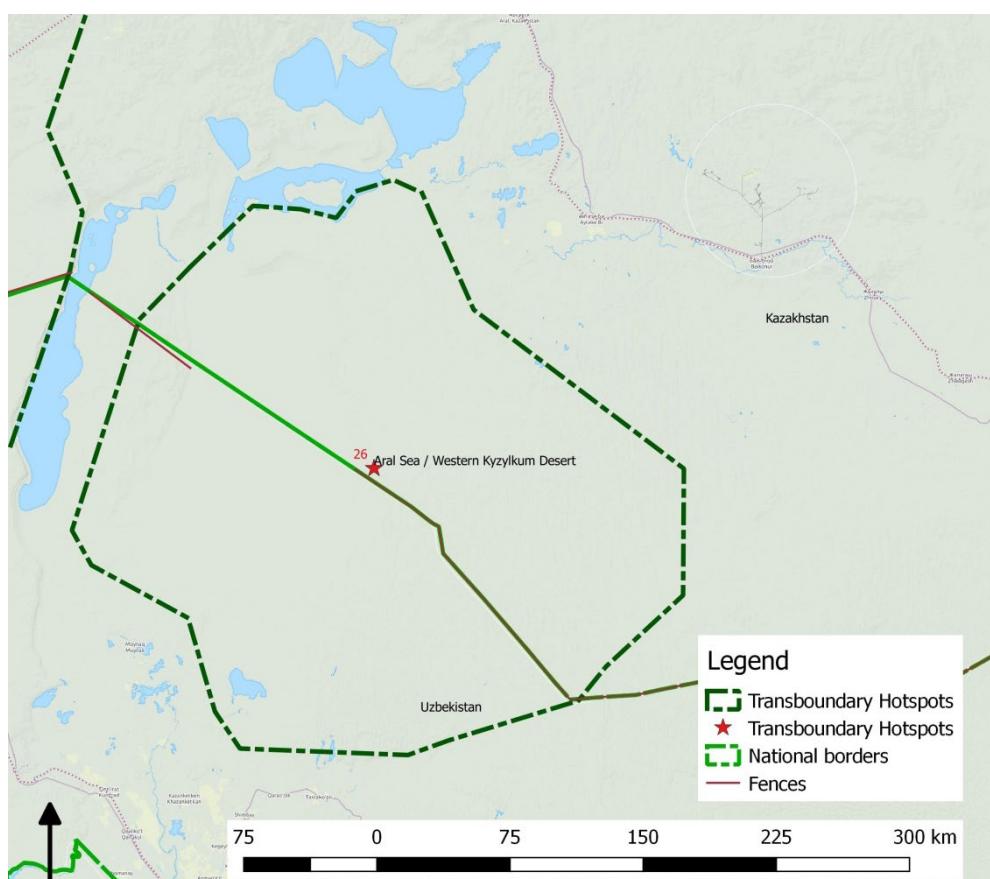
Administrative,

- Kazakhstan, Kyzylorda Province;
- Uzbekistan, Karakalpakstan Autonomous Republic.

Geographic area:

- Western part of Kyzylkum desert, eastern part of dry Aral Sea bottom, incl. former islands Barsa Kelmes and Vozrozhdenie.

Coordinates: N 44.642783°, E 60.664708°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Turanian, Aral Sea;

WWF Ecoregion (Olson et al., 2001): Central Asian northern desert;
Semi-desert, desert, mud and salt pans (*takyr* and *shor*), wetlands.

Species:

Asian wild ass:

Population size: Kulan had been introduced from Badkhyz to the island Barsa Kelmes between 1953 and 1963 (Kaczensky and Salemgareyev, 2019). Around 2000 the island became connected with the mainland and the kulan spread over parts of the dry sea ground and former island Kaskakulan at the eastern shore. In 2005 the population size was 179¹⁶.

¹⁶ <https://geosfera.org/aziya/kazaxstan/2167-barsakelmesskiy-zapovednik.html>

Currently the kulan population along the former Aral Sea shore is estimated at around 500, but systematic surveys have not been possible (Kaczensky, pers. comm. 2019).

Movements: The wild asses rely on water and visit artesian wells in the range area, in particular at Kaskakulan, but roam in a large area, including the former island Barsa Kelmes. In April 2019 three female kulan were captured and equipped with satellite GPS collars. Locations of the first ten days showed movements within an area of about 2,500 km² (Kaczensky and Salemgareyev, 2019).

Importance of transboundary population: So far there is no evidence that the kulan cross into Uzbekistan. Such movements may have happened undetected or may happen in the future and lead to the establishment of a transboundary population. The current population in and around Barsa Kelmes SPA is the second largest population of the subspecies.

Goitered gazelle:

Population size: Goitered gazelle numbers are not known for the larger area. About 50 gazelles had been present at the former island Barsa Kelmes in 2005¹⁷. On the mainland further to the east Pestov et al. (pers. comm. 2019) in 2019 observed only one single goitered gazelle despite intensive search and assumed that the population density must be extremely low.

Movements: Goitered gazelles have been known to be mobile over large areas of the Kyzylkum Desert. Low population density makes it currently difficult to assess movements. The border fence between Kazakhstan and Uzbekistan likely hinders transboundary movements, possibly restricting these to the unfenced part of the dry sea ground.

Importance of transboundary population: The existence of a transboundary population is not confirmed. Long-term conservation of goitered gazelle in the Kyzylkum would require connectivity of the population across the national border.

Saiga antelope:

Population size: The Site is range area of two introduced saiga populations: at the former islands Barse Kelmes and Vozrozhdenie. After Barsa Kelmes became connected with the mainland the saiga left it. 155 saigas were recorded at the peninsula Barsa Kelmes in 2005¹⁸. There are still saigas near the former Aral Sea shore, but the population size and trends are not known. In Uzbekistan saigas had been introduced to Vozrozhdenie Island. During 2007-2010 at least 100-150 saigas occurred there, fresh tracks have been confirmed at the island and adjacent sea ground in 2015 and 2017 (Sherimbetov, presentation 2019).

Movements: The introduced saiga populations appear rather sedentary. The population at former island Vozrozhdenie and its surroundings is transboundary between Kazakhstan and Uzbekistan. Movements of the population at the eastern Aral Sea shore from Kazakhstan into Uzbekistan are not known.

Importance of transboundary population: Both populations of saiga are small and of rather scientific interest than of importance for the conservation of the species. Of particular interest would be studying the trends of these populations, limiting factors, and – if growth can be achieved – if such introduced populations above a certain number become migratory.

Conservation significance:

The area is of highest significance for the conservation of kulan, due to its population size, the potential of the population to be used as source populations for introduction and the available habitat for further population growth. It is also important for the conservation of goitered gazelle in the Kyzylkum desert although current population density is apparently low and limiting factors are poorly understood. The conservation significance of the two very small introduced saiga populations is rather low. The Severtzov argali *Ovis ammon severtzovi* occurs in the Kyzylkum of Uzbekistan, but the range area is far from the border and there are no areas with potential for transboundary conservation of this species.

¹⁷ <https://geosfera.org/aziya/kazaxstan/2167-barsakelmesskiy-zapovednik.html>

¹⁸ <https://geosfera.org/aziya/kazaxstan/2167-barsakelmesskiy-zapovednik.html>

Protected areas status:

Kazakhstan: Barsa-Kelmes SPA with three sections – former island Barsa Kelmes, former island Kaskakulan and surrounding areas, peninsula at Northern Aral Sea, recognized as UNESCO Biosphere Reserve in 2016.

Barriers for migration:

- A border fence from Kazakhstan forms a barrier across the entire Kyzylkum Desert;
- At the eastern part of the Aral Sea ground with former islands Barsa-Kelmes and Vozrozhdenie no artificial physical barriers exist. However there are unconfirmed rumors about the construction of a fence on Vozrozhdenie by Kazakhstan. This need to be checked, but it is still impossible to navigate well on the land of a former bottom of Aral Sea.
- Larger sections of the former sea bottom may form barriers for movements of ungulates, at least in wet periods.

Other threats:

- Poaching is an issue at least at Vozrozhdenie (Bykova and Esipov, pers. comm., 2019; Sherimbetov, presentation 2019), but it likely occurs across the entire site, although Barsa Kelmes SPA has at least managed to control poaching of kulan at a level that permits population growth;
- Livestock grazing might locally cause competition for water and forage and habitat degradation;
- Commercial harvest of *Artemia salina* in the Aral Sea may cause some localized disturbance;
- Afforestation (saxaul forest) at the former bank of Aral Sea;
- Expansion of the network of canals at the former Aral Sea (Kazakhstan);
- Human, infrastructure and industrial development.

Existing or planned transboundary activities:

- Development of transboundary projects in the area of eastern Aral Sea with former islands Barsa-Kelmes and Vozrozhdenie, possibly across the entire Kyzylkum east to Lake Aydar. (It is not clear if there is already any specific planned or ongoing initiative.)

Recommendations for action:

- Gather reliable data about the fence and its technical parameters.
- Continue the study of kulan in and around Barsa-Kelmes SPA;
- Continue to study the status of the gazelle and saiga population on E Aral Sea with Barsa-Kelmes / Resurrection Island and impact of current development on these;
- Study the state of goitered gazelle in the Kyzylkum, including around Lake Aydar;
- Consider the possibilities for creating further protected areas or expanding Barsa Kelmes SPA.

Site ID: 27

Name: Eastern Turkestan Range

Countries: KGZ-TJK

Location:

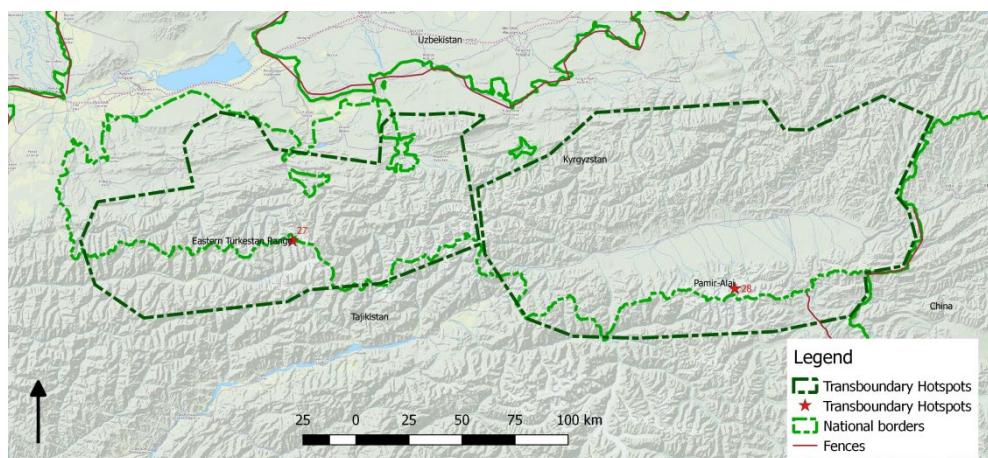
Administrative,

- Kyrgyzstan, Batken Province;
- Tajikistan, Sughd Province;
- Uzbekistan, Fergana Province.

Geographic area:

- Hissaro-Alai system (eastern Turkestan and Zerafshan ranges, including northern piedmonts).

Coordinates: N 39.596297°, E 70.542251°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir-Tian Shan highlands;

WWF Ecoregion (Olson et al., 2001): Pamir alpine desert and tundra, Gissaro-Alai open woodland;

High mountains, mountain grassland, juniper woodland, deciduous woodland, dry steppe, arable lands.

Species:

Argali (Severtzov sheep)

Population size: The range area of Severtzov argali *Ovis ammon severtzovii* in these mountain ranges had not been reconfirmed until 2010. In May 2011 Davletbakov and Musaev (2012) recorded six groups of argali, consisting of 37 animals in the foothills, of Zerafshan range. One of these groups was recorded at the border with the Uzbekistan enclave Sokh. In Tajikistan local people in the upper Zerafshan valley in 2011 talked to experts from the NGO NBCUT about argali occurrence and presented old skulls. In 2014 there one female with two lambs was observed (data by NBCUT and Tajikistan Mountain Ungulates Project). Further search in 2018 and 2019 did not yield any records and possibly argali is extinct there now.

Movements: Local people at the Site talk about seasonal vertical movements of the argali, but no specific information is available.

Importance of transboundary population: The argali in the northern foothills use transboundary habitat, given the mosaic of national borders in this area. But border fences may impede these movements. If the argali observed in Tajikistan belonged to a transboundary population is not clear as the border between Kyrgyzstan and Tajikistan is formed by the high ridge of the Zerafshan Range, which in this area may form a natural barrier. The population of Severtzov argali is likely extremely small, compared to the core

population in Uzbekistan's Nuratau SPA, which is estimated consisting of around 1,500 animals (Beshko, pers. comm. 2016). The population at the Site is important as isolated population of this subspecies and in the case of extinction natural recolonization is highly unlikely. Except the core population in the Nuratau SPA only five other small and isolated populations of this very distinctive argali subspecies are known.

Snow leopard:

Population size: The population size in the Site is not known and the Site is indicated in the CAMI Atlas as "possibly extant". Camera trap research in 2018 (Karimov et al., 2018) confirmed the presence of at least three individual snow leopards at the northern slope of Zerafshan Range at a rather limited research area of 13 camera traps.

Movements: Given the location of the national border between Kyrgyzstan and Tajikistan movements across this border may occur regularly.

Importance of transboundary population: The population is likely entirely transboundary between Kyrgyzstan and Tajikistan. It might not be significant in terms of numbers, but as important link between the populations of the western Hissaro-Alai system and the Pamirs.

Conservation significance:

Despite comparably low individual numbers the Site is of conservation significance – as remote and isolated habitat of a small population of Severtzov argali and as linking element of snow leopard populations and range areas. The Site covers sections of the GSLEP Landscape "Alay-Hissar".

Protected areas status:

None

Barriers for migration:

There might be at least partly border fences at the enclaves of Tajikistan and Uzbekistan in the lower parts of the mountains. The main ridge of Turkestan Range may form a natural barrier for argali.

Other threats:

- Livestock grazing: The Site, in particular in Tajikistan and in the northern piedmonts is intensively grazed by livestock. Locations at lower elevation and close to villages are year-round or winter grazing sites, at higher elevations summer pastures are used by large herds of livestock from other regions. Grazing takes place up to the highest ridges and has adverse impact on the target species through forage competition, habitat degradation, disturbance by people and dogs and conflict between herders and carnivores.
- Poaching: Ungulate densities appear below carrying capacities despite intensive grazing. This and the shyness of ungulates indicate substantial poaching. The decline and possible local extinction of Severtzov argali can likely be attributed to poaching.

Existing or planned transboundary activities:

- Under GSLEP the area is considered as part of the Snow Leopard Conservation Landscape "GSLEP Landscape "Alay-Hissar" and is planned to be included in transboundary monitoring and conservation activities.

Recommendations for action:

- Intensified and coordinated monitoring of the target species;
- Antipoaching efforts, in particular through the development of community-based wildlife management (currently one such local NGO active in the upper Zerafshan Valley in the Turkestan and Zerafshan Ranges);
- Measures for addressing herder carnivore conflict;
- Regulation of grazing is desirable but would be very hard to achieve.

Site ID: 28

Name: Pamir-Alai

Countries: KGZ-TJK-UZB

Location:

Administrative,

- Kyrgyzstan, Osh Province;
- Tajikistan, Gorno-Badakshan Autonomous Province;

Geographic area:

- Transalai and Alai ranges, Alai valley.

Coordinates: N 39.396534°, E 72.938290°

Map: see Site #27

Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir-Tian Shan highlands;

WWF Ecoregion (Olson et al., 2001): Pamir alpine desert and tundra, Gissaro-Alai open woodland;

High mountains, mountain grassland, juniper woodland, deciduous woodland, dry steppe.

Species:

Argali

Population Size: In the Pamirs of Tajikistan argali is abundant with 23,700 argali recorded in several sections of the entire area in 2009, and at least around 5,000 animals Marco Polo present in the areas close to the border with Kyrgyzstan. At the northern slope of the Transalai Range in Kyrgyzstan hardly any argali occur, likely due to poaching until recently. In the south-west of the site few hundred or less argali exist in a hunting concession according to local sources. No recent argali occurrence is known from the northern part of the Site, the Alai Range.

Movements: Argali are migrating on the high Pamirs, but rarely move through lower elevations with more dense human population and intensive livestock grazing. The Alai Valley seems to be rarely crossed barrier for argali movements and may represent the boundary between Marco Polo sheep *Ovis ammon polii* and Tien Shan argali *O.a.karelini* (Davletbakov, pers. comm. 2011). Local hunters report irregular movements of argali from Tajikistan into Kyrgyzstan at the northern slope of the Transalai range.

Importance of transboundary population: The population is only in a limited extent transboundary and the border between Kyrgyzstan and Tajikistan is located at or close to a natural geographic and related land-use boundary, which might also form the range area boundary of argali.

Snow leopard:

Not a hotspot for SL (Rosen pers. comm. 2019)

Population size: The Tajikistan part of the Site belongs to the larger snow leopard range area in the Pamirs. Only few snow leopards were recorded by camera traps in the Site, all in the northern slope of Transalai Range in the South of the Site. The northern part, the Alai Range is also indicated as probable snow leopard range area in the CAMI Atlas and Taubmann et al. (2015) based on interviews modelled there a high probability of site use in 2010 by snow leopard.

Movements: No information about regular movements is available for the Site.

Importance of transboundary population: The population is likely entirely transboundary between Kyrgyzstan and Tajikistan. It might not be significant in terms of numbers, but forms an important link between the snow leopards in the western Hissaro-Alai system and the Pamirs.

Conservation significance:

The Site has currently very limited significance for argali conservation, as it has only low numbers of the species, but is located in the vicinity of one of the most numerous populations of the species. Rosen (pers. comm., 2019) stated that the Site is not a hotspot for snow leopard. Despite comparably low individual numbers the Site is of conservation significance as linking element of snow leopard populations and range areas. The Site covers sections of the GSLEP Landscapes “Alay-Hissar” and “Pamir”.

Protected areas status:

Tajikistan: Tajik National Park, recognized as natural World Heritage Site by UNESCO

Barriers for migration:

There are no border fences in the Site, except towards China. The ridges and peaks of the Transalai Range form natural barriers.

Other threats:

- Poaching: Ungulate densities are below the carrying capacity and poaching incidents, including trapping of snow leopards, have been reported by community members. With the development of three community-based conservancies in the Kyrgyzstan part of the Site poaching was much reduced, as indicated by increasing ungulate populations, but has not entirely ceased within the conservancy areas and is still an issue outside of these;
- Trophy hunting: One area in the west of the Site is assigned as hunting concession to a commercial company. While the protection efforts and performance of the company cannot be assessed with the available information, it seems that hunters from the local communities feel alienated by this commercial operation of outsiders and may thus feel legitimized to poach (Community members in Sarytash, pers. comm. 2016).
- Livestock grazing: The intensity of grazing only locally may cause forage competition and habitat degradation.
- Mining: In at least two locations mining operations (coal, gold) are active. Local people in Chak village resisted gold mining due to environmental and safety concerns, but since 2018 mining has started, and so far adverse impact seems limited if any (Community members of Chak, pers. comm. 2018).

Existing or planned transboundary activities:

- Under GSLEP the area is considered as part of the Snow Leopard Conservation Landscapes “GSLEP Landscape “Alay-Hissar” and “Pamir” and is planned to be included in transboundary monitoring and conservation activities;
- With assistance by international NGOs the Kyrgyz customs service has been trained and provided with sniffer dogs to detect illegally traded wildlife products (argali, ibex, and snow leopard). In 2017 a party of illegally hunted and exported hunting trophies of argali and ibex from Tajikistan was detected and confiscated.

Recommendations for action:

- Community-based wildlife conservation: Step up anti-poaching efforts, in particular through the further development of community-based wildlife management. This requires that the areas currently protected by local community-based NGOs become assigned to these as game management areas and that hunting quotas for ibex are allocated in accordance to the population size;
- Livestock grazing: In the current intensity livestock grazing seems to have no substantial negative impact. Grazing intensity, seasonal and spatial patterns should be monitored and regulated if necessary. In case of conflict with carnivores avoidance and mitigation activities should be implemented.

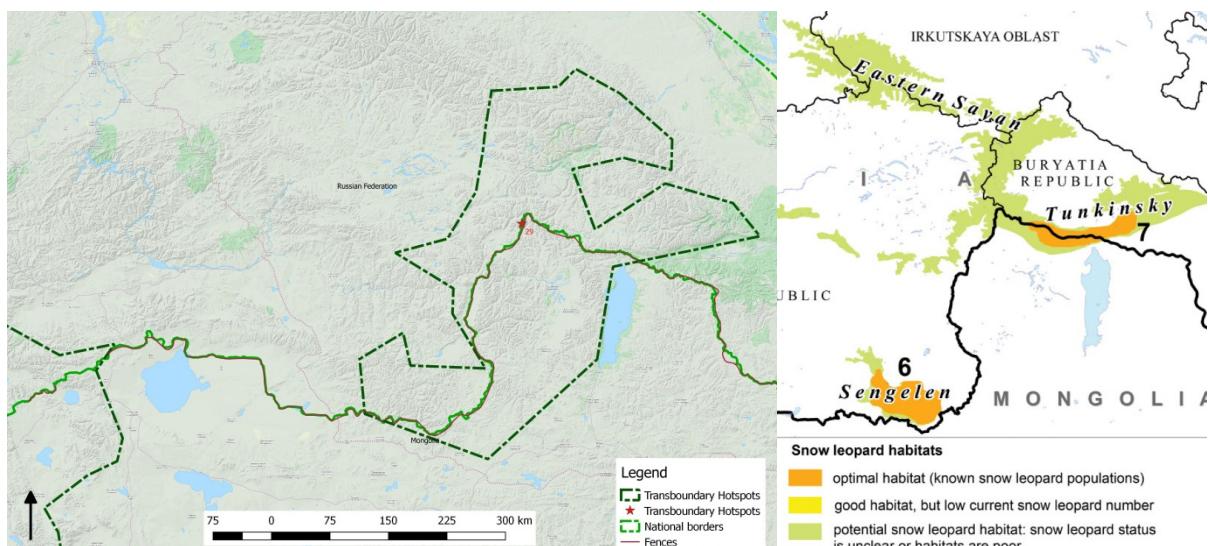
Location:*Administrative,*

- Mongolia, Khovsgol Aimag;
- Russia, Tuva Republic, Tere-Khol district and Buryatia Republic, Okinsk district.

Geographic area:

- Eastern Sayan mountains, incl. Khovsgol area.
- Bolshoy Sayan, Munku Sardyk, Khovsgol;
- Specific important areas to be determined!

Coordinates: N 52.040283°, E 98.815337°; Specifically recommended by Poyarkov (pers. comm. 2019); N 52.000°, E 99.225° (Bolshoy Sayan); N 51.730°, E 100.581° (Munku Sardyk)



Overview and snow leopard occurrence (Source Nyhus et al., 2015)

Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Altai Highlands;

WWF Ecoregion (Olson et al., 2001): Sayan alpine meadows and tundra, Sayan montane conifer forests, sayan intermontane steppe, Selenge-orkhon forest steppe; Alpine meadows, mountain tundra, mountain steppe, mountain woodlands and coniferous forests.

Species:***Argali***

The range area of the species as indicated in the CAMI Atlas includes the Site. The website of Tunkinskiy National Park¹⁹ in Russia also mentions the species, despite there is no overlap between the range area and the park boundaries. The WWF (2017) argali survey states that argali nowadays occur only in other parts of the Altay-Sayan Ecoregion. The National Mountain Ungulate Survey 2009 (Harris et al., 2010) does not provide figures for argali in Khovsgol Aimag and does not show any argali distribution units there, but mentions the species for Khoridol-Saridag SPA within the Site.

¹⁹ <http://www.tunkapark.ru/fauna/>

Movements: The argali are likely connected with groups in range area patches of the Altai to the west and the Tarvagatai to the south. The CAMI Atlas indicates a border fence between Mongolia and Russia. So transboundary movements of argali might be limited.

Importance of transboundary population: The population is likely small and possibly currently not transboundary. Given the small range area patches it is possible that argali presence is only maintained by immigrating animals from other range area.

Snow leopard:

Population size: The snow leopard is indicated for the Site in the CAMI Atlas, mainly as "probably extant". It is further mentioned in the website of Tunkinskiy NP²⁰ and on several websites about Azas SPA²¹. Nyhus et al. (2016) indicate most of the Site as "Potential Snow Leopard Habitat" and the immediate border region between the southwestern part of Burytia and Khovsgol Aimag as "Optimal Habitat (Known Snow Leopard Populations)". Another such habitat patch is indicated in the southeast of Tuva, near the border with Mongolia. No population figures are available.

Movements: The snow leopards in the area have to be connected with snow leopards in other range area patches. The range area indicated in Nyhus (2016) shows that transboundary movements are certainly assumed.

Importance of transboundary population: The conservation of snow leopard populations in the Site is only possible if the transboundary connectivity with other snow leopard range areas is maintained.

Conservation significance:

The Site has likely only small populations of the two occurring target species. It is of conservation significance as marginal range area.

Protected areas status:

Mongolia: Khoridol-Saridag SPA, Ulaantaiga SPA

Russia: Azas SPA, Tunkinskiy NP

Barriers for migration:

The CAMI Atlas indicates the existence of a border fence. Poyarkov (pers. comm., 2019) mentions that border fences are currently erected mainly by the Mongolian side.

Other threats:

- Poaching of argali and snow leopard (Poyarkov, pers. comm. 2019);
- Snow leopard as occasional bycatch of illegal musk deer snaring (Poyarkov, pers. comm. 2019);
- Over-hunting of ungulates causes problems for snow leopard (Poyarkov, pers. comm. 2019);
- Increase in livestock numbers and resulting habitat degradation, forage competition with argali and replacement of wild ungulates, human-wildlife conflict (snow leopard) and potentially disease transmission (Poyarkov, pers. comm. 2019);
- Fragmentation of range areas and populations make local extinctions highly likely, while recolonization is hampered by border fences and remoteness from potential source populations.

Recommendations for action:

- Intensified transboundary collaboration;
- Status assessment of the target species with determination of conservation potential, threats and options to address these;

²⁰ <http://www.tunkapark.ru/fauna/>

²¹ <http://www.ecotravel.ru/regions/reserves/1/17/116/>;
<http://oopt.aari.ru/oopt/%D0%90%D0%B7%D0%B0%D1%81>

- Implementation of the conservation measures recommended in the Strategy for the conservation of snow leopard in Russian Federation (Istomov et al., 2015).
- Establishment of protected area in the Eastern Sayan of Russia, in Mongolia in Khovsgol region protected areas are functional (Poyarkov, pers. comm. 2019);
- Regulation of livestock grazing;
- Increase of anti-poaching efforts;
- Removal or mitigation of border fences in critical areas.

Site ID: 30

Name: Western Hissar Mountains

Countries: TJK-UZB

Location:

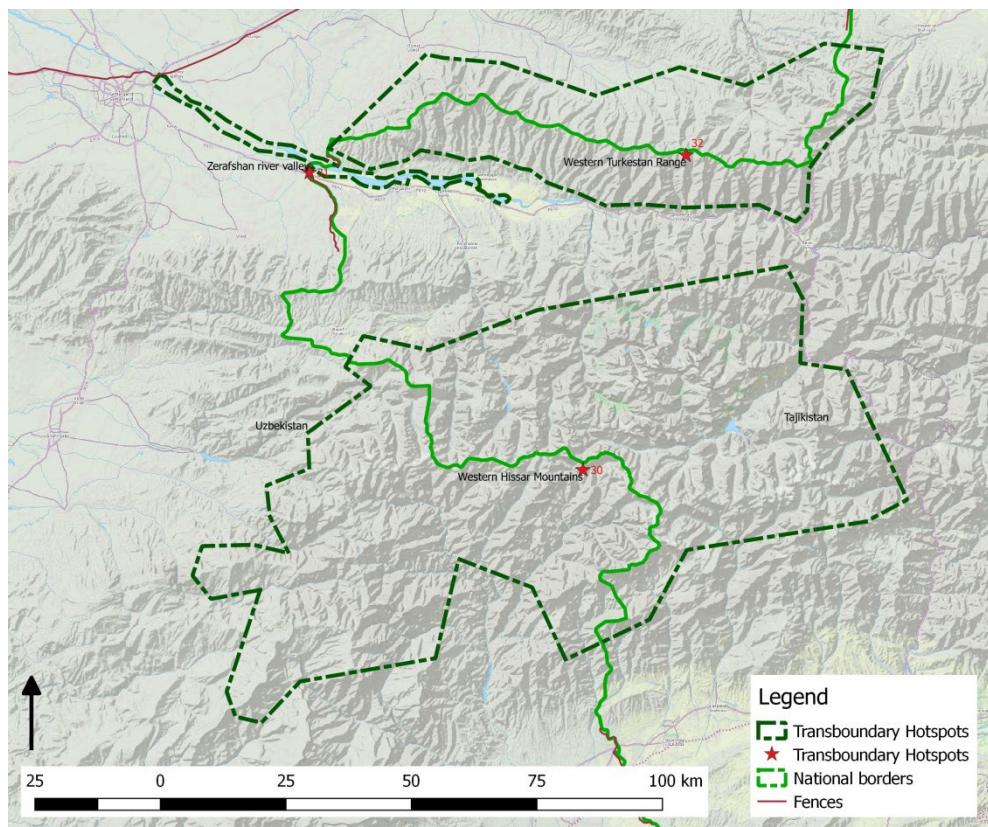
Administrative,

- Tajikistan, Sughd Province and Districts of Republican Subordination;
- Uzbekistan, Kashkadarya and Surkhandarya Provinces.

Geographic area:

- Western section of the Hissaro-Alai mountain range.

Coordinates: N 38.995356°, E 68.027545°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir-Tian Shan Highlands;

WWF Ecoregion (Olson et al., 2001): Gissaro-Alai open woodlands, Pamir alpine desert and trundra;

Alpine meadows, mountain dry steppe, sparse xerophytic shrubs, woodlands.

Species:

Snow leopard:

Population size: Snow leopard has been confirmed from the Tajikistan part (three camera trap pictures and more scats in different areas; Amirov and Karimov, 2014) and from Uzbekistan's Hissar SPA (camera trap records of at least two individuals in six events in 2013 and 2014, Nyhus et al., 2016). In Nyhus et al., 2016 guesstimates of 23-25 snow leopards for the Hissar SPA are presented, which might be an overestimate, even if assuming that these figures refer to the entire transboundary population. Fourteen visual encounters with cubs have been recorded between 1981 and 2014 (Nyhus et al., 2016). In 2018 rangers of Hissar SPA detected two cubs without mother and took them into custody of Tashkent Zoo – the moist recent evidence of a reproducing population at the Site.

Movements: The Site represents an edge of the snow leopard range area and their current presence relies on movements and exchange across a larger range area.

Importance of transboundary population: The population is certainly transboundary and can only survive in the mid and long term if connectivity with the larger range area of snow leopard is maintained.

Conservation significance:

Only one target species is present. The Site represents an edge of the snow leopard range and population size is likely small, but reproduction is confirmed. As extinction often starts at the periphery of range areas, its conservation is of significance for snow leopard conservation in general. Site covers parts of the GSLEP Landscape “Alay-Hissar”.

Protected areas status:

Tajikistan: Shirkent National Park, *Almosi Zakaznik*;

Uzbekistan: Hissar SPA.

Barriers for migration:

The border fences along the border between Tajikistan and Uzbekistan are limited to lowland areas and do not affect the Site. There are currently no known barriers at the Site.

Other threats:

- Poaching: The major limiting factors for snow leopards are direct persecution and low populations of prey species. Poaching of the main prey species at the Site, the Asiatic ibex impacts the prey availability.
- Livestock grazing: The Site, including the protected areas, is almost entirely used for livestock grazing, locally by large flocks of sheep and goats moved on high altitude pastures during summer season as well as intensive year-round grazing closer to villages. Degradation of vegetation is noticeable in several areas, forage competition with wild snow leopard prey and herder-snow leopard conflicts are issues across the Site.

Recommendations for action:

- The establishment of a National Park with large core zones and wilderness zones without livestock grazing should be pursued in the areas with low human density and less intensive land use between Hissar SPA and the border with Tajikistan, incl. Tupalang Valley.
- Community-based conservation initiatives and wildlife management should be developed to reduce poaching of ibex and develop local capacity for addressing conflict.
- Livestock grazing needs to be better regulated and grazing restrictions in protected areas have to be effectively enforced;
- Address herder-snow leopard conflict by preventive and mitigation measures.
- Transboundary collaboration between scientists, protected areas, communities and tourism managers in the spheres of wildlife monitoring, coordinated conservation activities and law enforcement as well as conservation-friendly tourism development.

Site ID: 31

Name: Zerafshan river valley

Countries: TJK-UZB

Location:

Administrative,

- Tajikistan, Sughd Province;
- Uzbekistan, Samarkand Province.

Geographic area:

- Zerafshan river valley between Jomboy and Husar.

Coordinates: N 39.520217°, E 67.404043°

Map: see Site #30

Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir-Tian Shan Highlands;

WWF Ecoregion (Olson et al., 2001): Alai-Western Tian Shan steppe, Gissaro-Alai open woodlands;

Riparian forests, woodlands and reeds, poplar plantations, orchards, irrigated arable lands.

Species:

Bukhara deer:

Population size: The Bukhara deer population is introduced and has two sources of origin. In the 1980s an enclosure had been established in Tajikistan and during the civil war the deer were intentionally or unintentionally released from there and established a small transboundary population. In Uzbekistan, close to the headquarters of Zarafshon Strict Nature Reserve an enclosure had been erected in the late 1990s for breeding and further reintroduction. The founder population had been 2 stags from Kyzylkum Strict Nature Reserve and 4 females from Baday-Tugay Strict Nature Reserve. Later few more deer from Kyzylkum Strict Nature Reserve were added. The herd was not actively managed and a high inbreeding coefficient is likely. Deer were released from this enclosure in 2005 and 2007. The natural park administration guesses the size of the wild population at around one hundred animals, but this number is not based on robust estimates and the real population size might be lower. (Michel, 2018) In 2018 Michel within one morning observed up to ten Bukhara deer in Tajikistan close to the border with Uzbekistan and recorded tracks more than 10 km upstream. Official sources stated the size of the Tajikistan/transboundary subpopulation with 12 to 20, which seems to be much below the real population size (Michel, 2018).

Movements: At the Site the deer move across the entire riparian area and also visit orchards and arable lands for grazing. Large areas in Zarafshon Natural Park without any signs of Bukhara deer presence indicate an overall small and possibly functionally fragmented deer population with two core areas – one in the downstream part in the western section, and a second one in the upstream areas of the eastern part, probably mostly using habitat outside of the natural park (tree plantation right of Pravoberezhniy canal) and in Tajikistan (Michel, 2018). The two subpopulations are divided by larger less suitable open gravel areas with few shrubs, which are rarely crossed (Marmazinskaya, pers. comm. 2018).

Importance of transboundary population: The Bukhara deer using the riparian habitats in Tajikistan and close to the border in Uzbekistan regularly cross the border and rely on transboundary habitat. Given the small overall size of the Site, the limited available suitable habitat and the limited number of founders the Bukhara deer population of the Site should be managed as one transboundary population.

Conservation significance:

The Site represents an isolated Bukhara deer population and unique riparian ecosystem. Conservation of Bukhara deer at the Site requires transboundary collaboration and the positive development of bilateral relations between the two countries allow for such collaboration.

Protected areas status:

Tajikistan: Zarafshon Zakaznik

Uzbekistan: Zarafshon NP

Barriers for migration:

The border fences between Uzbekistan and Tajikistan are located outside of the riparian areas and do not impact on Bukhara deer migration. The diversion weir at the border between Uzbekistan and Tajikistan and larger irrigation canals form potential local barriers, but are bypassed (weir) or crossed (canal). Larger sections of the river valley with open gravel areas or narrow sections without riparian plains form natural barriers, which may in some extent hinder movements and reduce habitat connectivity.

Other threats:

- Forest degradation: Illegal cutting of trees as well as regular forestry activities have caused changes in structure and composition of riparian forests. Some areas have been transformed into poplar plantations, which are also used by the deer.
- Livestock grazing: Almost the entire Site is used for grazing of cattle. While in some extent cattle and deer can coexist, but there is forage competition and both species impact on forest regeneration.
- Dykes: Building of dykes changes the river course and impacts the flood dynamics in the riparian forests and thus the vegetation growth and composition. Changes of the morphological dynamics of the river cause massive lateral erosion and losses of riparian forests and high quality deer habitat, in particular near Panjakent.
- Land conversion: Large areas of the riparian plain have in the past been converted into arable lands. Conversion of riparian areas into arable lands is accompanied by dyke construction and has caused habitat loss much beyond the reclaimed lands.
- Poaching is likely an issue, but additionally to the protected areas staff also be prevented by the border police in Uzbekistan (Marmazinskaya, pers. comm. 2018).

Existing or planned transboundary activities:

- GIZ scoping mission 2018 for identifying the potential for developing a regional small-scale project financed by the SFF fund (BMZ) related to “Cross-border integrated protected area management of Zarafshon National Natural Park (Uzbekistan) and Zarafshon Reserve (Tajikistan)”, the project is not yet confirmed, but still under consideration (Haller, pers. comm., May 2019).

Recommendations for action:

- Cross-border collaboration between national level institutions and at the level of the local protected areas and scientific institutions in research, monitoring and conservation activities;
- Elaboration of a transboundary conservation management plan for Bukhara deer, including management of the captive herd in Uzbekistan;
- Maintenance of natural riparian hydrological and geomorphological dynamics;
- Integration of protected area management with forest management under minimum intervention in vegetation dynamics
- Clear determination of permitted, restricted and illegal activities, prevention of the proliferation of illegal use, prevention of conversion of riparian areas into arable lands;

- Consideration of the inclusion of additional areas with high biodiversity and ecosystem conservation potential and of areas potentially suitable for the development of tourism and recreation.

Site ID: 32

Name: Western Turkestan Range

Countries: TJK-UZB

Location:

Administrative,

- Tajikistan, Sughd Province;
- Uzbekistan, Jizzakh Province.

Geographic area:

- Turkestan Range west of Shahristan.

Coordinates: N 39.550563°, E 68.262615°

Map: see Site #30

Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir-Tian Shan Highlands;

WWF Ecoregion (Olson et al., 2001): Gissaro-Alai open woodlands, Alai-Western Tian Shan steppe;

Alpine meadows, mountain dry steppe, sparse xerophytic shrubs, woodlands.

Species:

Argali (Severtzov sheep)

Population size: Occurrence of Severtzov argali *Ovis ammon severtzovii* had been reported for the western sections of Turkestan Range in the past from Uzbekistan. Due to the location in the border zone and low capacity of Zaamin SPA no systematic research took place during the last three decades. Musaev et al. (2016) referring to reports by border guards assess the population there with 30-40 animals. In Tajikistan in 2014 a group of one male, three female and two yearlings was recorded in 2014 (data by NBCUT and Tajikistan Mountain Ungulates Project) close to the border with Uzbekistan. According to a ranger from Zarafshon NP in fall 2015 a male argali had been captured by local people near Mugal village, close to the border with Tajikistan.

Movements: No specific information is available.

Importance of transboundary population: The argali in the Site is certainly transboundary, given the proximity of recent observations to the border and the fact that the Turkestan Range is not a barrier for movements. The population of Severtzov argali is likely extremely small, compared to the core population in Uzbekistan's Nuratau SPA and its vicinity, which is estimated consisting of around 1,500 animals (Beshko, pers. comm. 2016). The population at the Site is important as isolated population of this subspecies and in the case of extinction natural recolonization is highly unlikely. Except the core population in the Nuratau SPA only five other small and isolated populations of this very distinctive argali subspecies are known.

Snow leopard:

Population size: The population size in the Site is not known and parts of the Site are indicated in the CAMI Atlas as "possibly extant". In Uzbekistan in recent years, the Zaamin Reserve has not conducted research. The small staff of the protected areas lacked the ability to conduct regular monitoring. If a population exists, it is likely small, perhaps just 2–3 individuals (Nyhus et al., 2016). Rosen (pers. comm. 2019) assumed there are no snow leopards in the Site. There are very few Asiatic ibex in the area (Nyhus et al., 35-40 in Zaamin SPA), so that prey availability may limit the suitability of the Site for snow leopard.

Movements: Given the location of the national border between Uzbekistan and Tajikistan movements across this border may occur in the case of snow leopard presence.

Importance of transboundary population: Snow leopard occurrence in the area is not recently confirmed and any presence would likely be temporarily only. The area is neither stepping stone nor corridor connecting other snow leopard range areas.

Conservation significance:

The Site is of some conservation significance – as remote and isolated habitat of a small population of Severtzov argali. It is less important for snow leopard conservation but covers sections of the GSLEP Landscape “Alay-Hissar”.

Protected areas status:

Uzbekistan: Zaamin SPA and Zaamin National Park

Barriers for migration:

There border fences between Uzbekistan and Tajikistan in the lowest parts of the mountains, but not in high mountains, thus causing little negative impact on the target species.

Other threats:

- Poaching and unsustainable trophy hunting
- Breeding enclosure
- Livestock grazing: The Site, in particular in Tajikistan is intensively grazed by livestock. Grazing takes place up to the highest ridges and has adverse impact on the target species through forage competition, habitat degradation, disturbance by people and dogs and conflict between herders and carnivores.
- Poaching: Ungulate densities appear below carrying capacities indicating substantial poaching. According to the Forestry Enterprise Panjakent in Tajikistan (pers. comm. 2018) at the southern slope of Turkestan Range a huntin concession has been assigned to a private company few years before. Already in June 2017 pictures of a trophy hunted Severtzov argali, allegedly from Tajikistan, had appeared in the internet. By all available information the population is too small to allow for sustainable trophy hunting and no allocation of quotas for Severtzov Argali, which is legally protected, by the Government of Tajikistan are known.

Existing or planned transboundary activities:

- Under GSLEP the area is considered as part of the Snow Leopard Conservation Landscape “GSLEP Landscape “Alay-Hissar” and is planned to be included in transboundary monitoring and conservation activities.

Recommendations for action:

- Intensified and coordinated monitoring of the target species;
- Expand Zaamin SPA and Zaamin National Park by annexing the adjacent north-facing slopes of the Turkestan Range;
- Prevention of trophy hunting on argali until the population has reached sufficient size for sustainable use and suitable management and benefit sharing are in place;
- Community-based wildlife management for the conservation of Severtzov argali;
- Regulation of grazing is desirable but would be very hard to achieve.

Site ID: 33

Name: Babataq

Countries: TJK-UZB

Location:

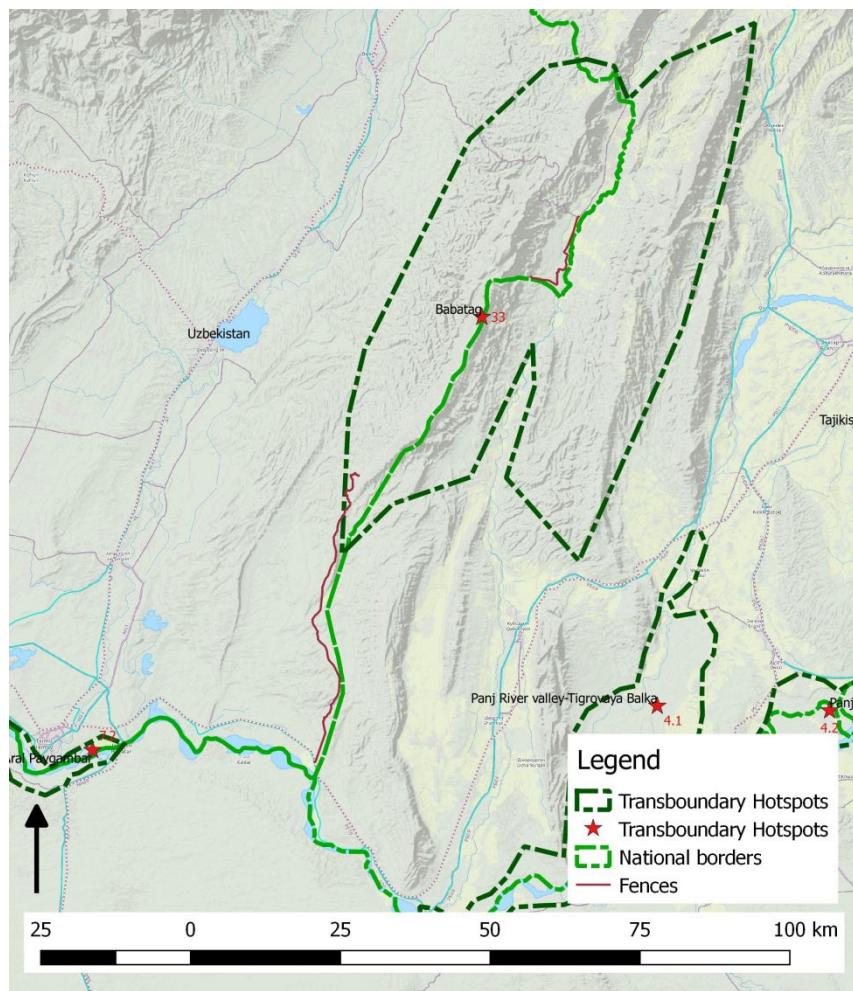
Administrative,

- Tajikistan, Khatlon Province;
- Uzbekistan, Surkhandarya Province.

Geographic area:

- Babataq range and adjacent mountain ranges.

Coordinates: N 37.877689°, E 68.114596°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir-Tian Shan Highlands;

WWF Ecoregion (Olson et al., 2001): Gissaro-Alai open woodlands, Badghyz and Karabil semi-desert;

Semi-desert, dry steppe, sparse xerophytic shrubs, woodlands (e.g. pistachio).

Species:

Goitered gazelle

Population size: According to Normatov (2016) in the mid-1980s goitered gazelle was exterminated in the *adyrs* (piedmonts) of Babataq in Uzbekistan. From Tajikistan no information about past and recent observations in the Site are available. As the area due to

its poor accessibility and the restrictions of the border zone is not well researched, there is a minor chance that a small population might still exist.

Movements: No information is available. In the lower parts of the Site movements are restricted by a border fence from Uzbekistan.

Importance of transboundary population: Currently population is extinct or extremely small. Potentially suitable habitat would be tranboundary.

Urial

Population size: In the early 2000s about 40 urials were assumed to exist in the Uzbekistan part of the Site (Musaev et al., 2016). Normatov (2016) mentioned that locals until around 2012 annually caught about 10 urial lambs as pets, but since then such information is missing, possibly indicating a massive decline in the population numbers. In Tajikistan urial is known from the neaby located Aktau range, which hosts a population of likely more than 100 urials (Michel, various local reports, own observations 2018).

Movements: Urials seasonally migrate over distances of several ten kilometres. The Babatag and adjacent areas are likely used by one connected population.

Importance of transboundary population: The Bukhara urial *O.a.bocharensis* is one of the rarest and probably fastest decreasing urial populations. The site provides habitat to a population of high importance of the conservation of the subspecies.

Persian leopard:

Population size: The leopard in the past existed in this Site, but since the 1960s confirmed records are missing (Marmazinskaya, 2016). Ustyan (pers. comm. 2009) still in the 1970s observed two animals (probably female with cub) in this area. Some zoologists report about rumors that leopards are still present in the area (Muratov, pers. comm. 2009; Marmazinskaya, 2016 & pers. comm. 2018. Normatov (2016) quotes reports of local hunters having observed leopards in 2003, 2006 and 2008 in the central and southern parts of the mountain range.

Movements: Leopards are highly mobile and can appear many tens and even hundred kilometers away from their core range areas.

Importance of transboundary population: If any leopards exist in the area, they could only survive as transboundary population.

Conservation significance:

The area is of significance for the conservation of one target species – urial, and in particular its subspecies *O.a.bocharensis*. Leopard presence is considered possible and there is a minor chance of goitered gazelle being extant. In addition to the target species, striped hyena *Hyaena hyaena* has a reproducing population there (Normatov, 2016). This species is rare and declining across Central Asia.

Protected areas status:

No protected areas existing.

Barriers for migration:

A border fence seems to exist only in lower sections; it would potentially impact goitered gazelle if at all present in the Site.

Other threats:

- Poaching: Normatov (2016) reported about past and recent poaching of urial, goitered gazelles and hyenas. Poaching is most likely the key threat.
- Livestock grazing: The extent and intensity of grazing is currently not known, but given current grazing pressure in similar areas in both countries it likely has impact.

Recommendations for action:

- Cross-border assessment of occurrence of target species, habitat conditions, migrations and limiting factors;
- Determination of approaches to reduce poaching and if necessary regulate grazing.

Site ID: 34

Name: Lower Amudarya

Countries: TKM-UZB

Location:

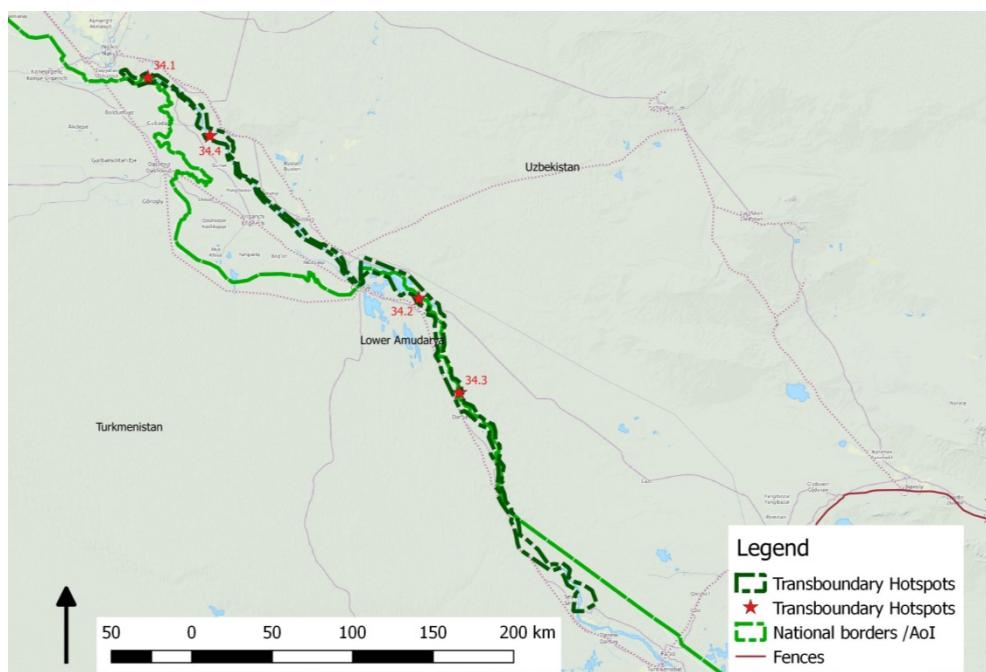
Administrative,

- Turkmenistan, Dashoguz Province;
- Uzbekistan, Karakalpakstan Autonomous Republic, Khorezm Province.

Geographic area:

- Riparian areas of the lower Amudarya river valley between Nukus (UZB) and Seydi (TKM).
- Amudarya s of “Kungrad”/Imeni Telmana, incl. Nazarkhan core zone (1);
- Amudarya near Lebap between Khorezm and Kyzylkum SPA (at TKM side) (2);
- Amudarya SPA (TKM) and Kyzylkum SPA (UZB) (3);
- Baday-Tugay (4).

Coordinates: N 42.307920°, E 59.877521° (1); N 41.124536°, E 61.821193° (2);
N 40.612679°, E 62.112579° (3); N 41.998413°, E 60.322092° (4)



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Turanian;

WWF Ecoregion (Olson et al., 2001): Central Asian riparian woodlands, Central Asian southern desert;

Riparian areas with *tugai* forest, riparian woodlands and shrubs, reeds, semi-desert, irrigated arable lands.

Species:

Bukhara deer

Population size: The overall population of Lower Amudarya Biosphere Reserve is about 800 Bukhara deer (Musaev et al., 2016). The largest population exists in Baday-Tugay (4), where in 2010 the number was estimated at 666 (Pereladova, 2015). Mambetullaeva et al. (2016) refrain from providing a recent population estimate in their article about Bukhara deer in Lower Amudarya Biosphere Reserve. At Nazarkhan core zone (1) currently no or very few deer are present. Here a reintroduction enclosure has been established under a UNDP-GEF

project. In Kyzylkum SPA (3) the population in 2011 was about 130 (Pereladova, 2015) and according Musaev et al. (2016) fluctuates between 120 and 150. In Turkmenistan the population in 2011 was 50-70 (Pereladova, 2015) but these animals may use in some extent transboundary habitats.

Movements: Bukhara deer migrate along the river course, but also seasonally move from the riparian areas into the desert to forage there during the short vegetation season.

Importance of transboundary population: The largest number of Bukhara deer currently exists in Baday-Tugay (UZB), which is not immediately at the border. Despite currently connectivity and natural exchange between different groups of Bukhara deer might be limited, the entire population of the Site should be considered as one transboundary population. The Site includes habitat patches at the border or in its immediate vicinity, like Nazarkhan core zone (UZB) and Kyzylkum (UZB) and Amudarya (SPA). Between the latter areas already currently regular transboundary movements are likely.

Conservation significance:

The Site is of high significance for the conservation of Bukhara deer. It includes areas with high density of deer as well as suitable habitat without or with very few deer. Furthermore, the Site represents important examples of riparian ecosystems and their biodiversity. Small and fragmented patches of riparian ecosystems are potential links or stepping stones between other, larger range areas.

Protected areas status:

Turkmenistan: Amudarya SPA

Uzbekistan: Lower Amudarya BR incl. Nazarkhan and Baday-Tugay core zones, Kyzylkum SPA

Barriers for migration:

Border fences may exist outside of the immediate riparian areas and are thus of low impact for Bukhara deer. The major barriers are areas with dense human populations, where riparian habitats are entirely transformed into arable lands and towns. The fragmentation of the riparian deer habitat limits carrying capacity of the ecosystem, contributes to human-wildlife conflict and

Other threats:

- Transformation of riparian areas into farmlands and urbanized areas;
- Poaching;
- Habitat degradation, caused by changed river dynamics, livestock and local deer populations exceeding carrying capacity.

Recommendations for action:

- Transboundary assessment of distribution, population size and structure, habitat use and migration of Bukhara deer;
- Elaboration and implementation of transboundary concept for conservation, management and sustainable use of Bukhara deer and its habitat, including addressing of coexistence of deer and agriculture and management of human-wildlife conflict;
- Prevention of further transformation of riparian ecosystem into farmlands and establishment of habitat corridors to facilitate connectivity between patches of deer habitat.

Site ID: 35

Name: Kugitang/Koytendag

Countries: TKM-UZB

Location:

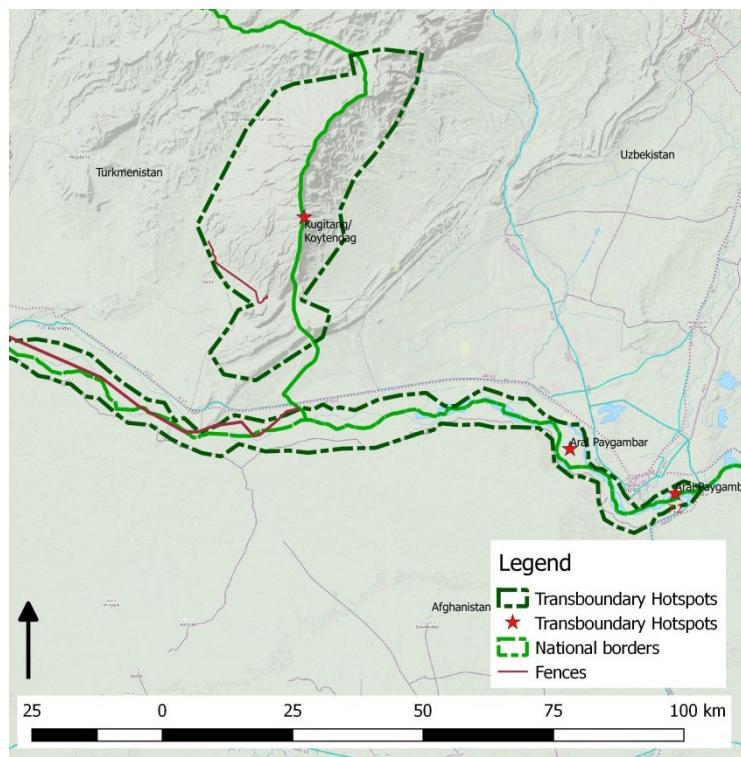
Administrative,

- Turkmenistan, Lebap Province;
- Uzbekistan, Surkhandarya Province.

Geographic area:

- Kugitang/Koytendagh range.

Coordinates: N 37.701902°, E 66.552273°



Biogeographical region; major ecosystems/habitat types:

Udvardy 1982: Pamir-Tian Shan Highlands;

WWF Ecoregion (Olson et al., 2001): Badghyz and Karabil semi-desert;

Woodlands (juniper, pistachio), xerophytic shrubs, dry steppe, semi-desert.

Species:

Goitered gazelle

Population size: According to Normatov (2016) goitered gazelle has in the past been a common and numerous species, but has been exterminated in most areas in the 1970s. A small population still exist in the piedmonts of Kugitang in Uzbekistan. The CAMI Atlas indicated the piedmonts in both countries as range area of the species.

Movements: No information is available.

Importance of transboundary population: According to the CAMI Atlas and the available literature there is currently no transboundary population. Potentially suitable habitat would be tranboundary.

Urial

Population size: Kholikov (pers. comm., 2014) in 2013 recorded 45 urials in Surkhan SPA in Uzbekistan. Rustamov (pers. comm. 2018) assumes that about 250 urials exist at the Turkmenistan part of the Site.

Movements: Urials reportedly migrate over some ten kilometers and the Site has no barriers for their movement. However, data provided by Kholikov (pers. comm., 2014) show some continued presence in certain areas.

Importance of transboundary population: The population should be considered as transboundary.

Persian leopard

Population size: In the Kugitang in Uzbekistan leopards have repeatedly been recorded in the 1990s. One leopard has been killed by poachers in 2010 (Marmazinskaya, 2016).

Movements: Normatov (2016) reports a leopard observation by border guards in the riparian area east of Termez and concludes that leopards in Kugitang and nearby Susyztau are connected with the range area in Babatag (Site #33) via the riparian areas of the Amudarya.

Importance of transboundary population: The population of the Site is transboundary and via the border areas with Afghanistan further connected with other parts of the range area.

Connectivity of possibly still existing small leopard groups is important for the conservation of the Persian leopard in its fragmented range area.

Conservation significance:

The Site is of high significance for the conservation of one target species – urial, and in particular its subspecies *O.a.bocharensis*. Leopard presence is possible and there is a minor chance of goitered gazelle being extant. In addition to the target species, markhor *Capra falconeri heptneri* is present with a large population of about 300 in Uzbekistan (Kholikov, pers. comm. 2014) and similar numbers likely occur in Turkmenistan.

Protected areas status:

Turkmenistan: Koytendag SPA

Uzbekistan: Surkhan SPA

Barriers for migration:

In the lower parts of the Site movements are restricted by a border fence from Turkmenistan at least in parts.

Other threats:

- Poaching;
- Livestock grazing: in SPA illegal grazing, outside poorly regulated and overly intensive grazing;
- Cutting of trees and shrubs.

Recommendations for action:

- Transboundary collaboration between the SPAs in research, monitoring and conservation activities;
- Improvement of law enforcement;
- Regulation of grazing;
- In Uzbekistan follow-up on UNDP-GEF supported buffer zone management plan implementation.

5. Discussion and Recommendations

5.1 Determination of priority sites

Determining priority sites is a challenging task given the multitude of aspects to be considered. Considering too many aspects may lead to an overly sophisticated approach. Not considering sufficiently the complexity of the issue may lead to inadequate priority setting.

For the purpose of this study, an attempt to prioritize the identified TAs was made by combining the following criteria:

- **The importance of the area** with regard to the number of CAMI species occurring in it as well as and its importance for the population (e.g. regularity of occurrence, population sizes or densities, share of global or regional populations);
- **Potential for conservation success**, including recovery of small populations and the technical feasibility of rehabilitating populations and migrations;
- **The existence of problems**, which are to be addressed in a transboundary context;
- **The urgency** of intervention to prevent continuing declines or even local extinction of target species;
- **The feasibility of interventions**, which consists of several elements, like the economic feasibility and political willingness of actors of addressing barriers.

For the purpose of priority ranking for every TA each of the criteria was assigned a score:

Criteria		Score
Importance of the area	<i>Number of species</i>	Total number of confirmed target species
	<i>Population status</i>	1 = occurrence irregularly or previously 2 = regularly 3 = substantial numbers
Potential for conservation success		0 = none
Existence of problems		1 = low
Urgency		2 = medium
Feasibility of interventions		3 = high

As requested by the CMS Secretariat the Consultant did not consider urial and Persian leopard when assigning of scores under these criteria to the TAs, as they are not covered by CAMI.

The importance of an area can be determined by the number of target species present in the area. However, it is often difficult to determine whether a species is actually present in a particular area or not. The approach taken here is that only those species were counted as present, if they are known to have likely occurred in the area at least during the past 50 years.

Another aspect of importance is the **population status** of species, i.e. the degree of occurrence of the species: has it occurred in the area only historically or irregularly, in small or large numbers and density or what share of the global or regional population is present. Some species occur only in small numbers in a very fragmented range area, but the survival of each population patch is important despite only small local population numbers. With only one species as the most important in an area, this aspect can be assessed if sufficient information is available. For sites with more than one focus species, it is difficult to determine the total importance of the site because it is of different importance for the different species. In these cases, either the score for the species with the most important population was applied or a combined score.

The potential for conservation success can be assessed from various angles. For areas with several species present in viable populations the assigned score would be high. However, the potential for recovery of currently low and even of locally extinct populations also needs to be considered. As an example – the Badghyz area (AFG, IRN, TKM) until recently had the last autochthonous and for many years the most numerous population of the kulan *Equus hemionus kulan*, a subspecies of Asiatic wild ass. They are now down to very low numbers and most likely they were completely exterminated by poaching. However, the area still has the potential that the species can recover if poaching is prevented and other measures are implemented. The potential thus has a technical dimension. Where recolonization or reintroduction of extinct species is very difficult or impossible or where revival of transboundary populations cannot be achieved because of the biological features of the species, the potential would be zero or low.

Existance of problems: Areas might become higher priority for conservation action if there are problems or threats, which require transboundary interventions or where transboundary collaboration would help solving the problem. This is especially the case where border fences hinder migration that is vital for the survival of the respective populations in the short or mid-term. Similarly high priority would be assigned to sites where migrations take place, but threats in one part of the range area threaten the survival of the whole population.

Urgency can be defined by the pace of negative trends in populations caused by barriers to migration as well as by other threats. A high urgency would be assigned where existing problems require urgent attention in order to retain or restore the integrity of the site and/or prevent further population declines.

Feasibility refers to interventions needed to address problems including those of transboundary character, but also threats at the national level and to which extend it is feasible to realize the actions needed. Feasibility has technical and political dimensions, but there might also be economic aspects to be considered, which can be covered within the political dimension of feasibility.

The sum of the scores for each area was used for determining the preliminary priority rank of each sites, from 1 (highest priority) to 12 (lowest). Total scores assigned are in the range between 6 (Site #33 Babatag) and 17 (Site #15 South-western Gobi). The ranking in the matrix below showed that the following areas 17 with a totals score >10 can be preliminarily considered as priority sites for transboundary conservation in the frame of CMS and CAMI:

- 1 – Total score 17: Site #15 South-western Gobi;
- 2 – Total score 16: Site #14 Gobi desert / Yin mountains;
- 3 – Total score 15: Site #24 South-western Ustyurt
- 4 – Total score 14: Sites #10 Khan Tengri region; #11 Altai; #16 Jungarian Gobi; #22 Ural steppe;
- 5 – Total score 13: Site #18 Kopet Dagh;
- 6 – Total score 12: Sites #1 High Pamirs; #12 Southern Tien Shan;
- 7 – Total Score 11: Sites #3 Wakhan; #6 Badghyz; #8 Jungarian Alatau; #9 Tarbagatay/Saur Ranges; #17 Daurian steppe; #26 Aral Sea/Western Kyzylkum desert; #34 Lower Amudarya.

But consideration of specific aspects may justify diverging determination of priorities.

These sites also represent different types of ecosystems and can be assigned to the different sub-regions mentioned in the current CAMI programme of work 2014-2020 as follows:

1. **Mountain ecosystems** (snow leopard and argali):

- #10 Khan Tengri region; #11 Altai (all total score 14);
- #1 High Pamirs; #12 Southern Tien Shan (both score 12);

- #3 Wakhan; #8 Jungarian Alatau; #9 Tarbagatay/Saur Ranges (all total score 11);
2. **Gobi-Desert – Eastern Steppes ecosystems** (wild ass, wild camel, Mongolian gazelle, goitered gazelle, Przewalski's horse):
#15 South-western Gobi (score 17);
#14 Gobi desert / Yin mountains (score 16);
#16 Jungarian Gobi (score 14);
#17 Daurian steppe (score 11);
 3. **South-west** (cheetah, goitered gazelle, chinkara, wild ass [kulan/onager], leopard, urial) **plus Central region** (saiga, not covered in the PoW):
#24 South-western Ustyurt (both total score 15);
#22 Ural steppe (total score 14);
#18 Kopet Dagh (total score 13);
#6 Badghyz; #26 Aral Sea/Western Kyzylkum desert (both total score 11);
 4. **Tugai forests** (Bukhara deer):
#34 Lower Amudarya (score 11).

Matrix for ranking of the sites:

(Scores: Species numbers: score = total number of confirmed target species; Population status: occurrence irregularly or previously = 1, regularly = 2, substantial numbers = 3; other criteria not = 0, low = 1, medium = 2, high = 3)

Site #	Name	Importance by Species number (absolute number)	Importance by Population status	Potential of conservation success	Problems to be addressed in a transboundary context	Urgency	Feasibility from a political and or economic perspective	Total score	Priority rank
1	High Pamirs	2	3	3	2	1	1	12	6
2		3	1	1	1	1	0	7	11
3	Wakhan	1	3	3	1	1	2	11	7
4	Panj River valley-Tigrovaya Balka	1	3	2	1	1	1	9	11
5	Panj River valley	1	1	2	1	1	1	7	10
6	Badghyz	2	1	1	3	3	1	11	7
7	Aral Paygambar	1	1	2	2	2	1	9	9
8	Jungarian Alatau	2	2	2	2	2	1	11	7
9	Tarbagatay/Saur Ranges	2	2	2	2	2	1	11	7
10	Khan Tengri region	2	2	3	3	2	2	14	4
11	Altai	2	2	2	3	3	2	14	4
12	Southern Tien Shan	2	3	3	1	2	1	12	6
14	Gobi desert / Yin mountains	4	3	3	2	2	2	16	2
15	SW Gobi	5	3	3	2	2	2	17	1
16	Jungarian Gobi	5	2	2	1	2	2	14	4
17	Daurian steppe	1	2	3	2	1	2	11	7
18	Kopet Dagh	2	2	2	3	3	1	13	5
19	Western Kyrgyz range	2	1	2	1	1	2	9	9
20	Northern Tien Shan	2	2	2	1	1	2	10	7

21	Western Tien Shan	2	1	1	1	1	2	8	10
22	Ural Steppe	1	3	3	2	2	3	14	4
23	Northern Betpakdala	1	1	2	2	1	3	10	8
24	South-western Ustyurt	3	2	2	3	3	2	15	3
25	Eastern Ustyurt	2	1	1	2	1	1	8	10
26	Aral Sea / Western Kyzylkum Desert	2	2	2	1	2	2	11	7
27	Eastern Turkestan Range	2	1	1	1	1	1	7	11
28	Pamir-Alai	2	1	2	1	1	2	9	9
29	Eastern Sayan	2	1	1	1	1	2	8	10
30	Western Hissar Mountains	1	1	1	1	1	2	7	11
31	Zerafshan river valley	1	2	2	1	1	2	9	9
32	Western Turkestan Range	2	1	1	1	1	1	7	11
33	Babatag	1	1	1	1	1	1	6	12
34	Lower Amudarya	1	3	2	2	2	1	11	7
35	Kugitang/ Koytendag	1	1	2	1	1	1	7	11

5.2 Recommendations

Preliminary recommendations for conservation action have been listed in section 4.2 for each of the individual areas. These actions are subject for discussion at the CAMI Range States Meeting in Mongolia and in consultation with the different stakeholders. In addition to the site-specific recommendations, this chapter attempts to draw some general conclusions and develop recommendations about how to enhance transboundary conservation in the context of CAMI.

The purpose of trying to prioritize the TAs was to help focusing limited resources to areas that are important, need action most, and where interventions are feasible, ie. likely to bear fruit. However, while this is a rather political necessity, it is important to note that also those areas with low scores under the numerical assessment above still play important roles for the conservation of the target species and are therefore all worth of implementing specific activities or including them into broader programs.

Across the region transboundary collaboration at various levels in most areas is rather weak. As a first step, information exchange should be developed and institutionalized. This has to start at the national level. Government authorities in charge of nature conservation, wildlife and protected areas need to communicate across the borders. They should involve experts, protected area managers and others involved in the specific sites from the very beginning. Direct local exchange should be set up allowing for immediate communication between the organizations and the people working on the ground in the transboundary areas. Exchange of information about populations and migrations of the target species, about observed barriers to migration and about conservation action considered, needs to be shared across the borders.

Information on border area characteristics and in particular on border infrastructure is typically considered highly sensitive and unauthorized exploration of the situation and sharing of information with foreign organizations and individuals is often difficult. Therefore, consultation with and involvement of governmental authorities in charge of border security and customs control is crucial at any stage. The development of cross-border collaboration between these organs with involvement of conservation authorities and practitioners is desirable, but most likely possible only under very favourable circumstances, where neighboring states are joined in a customs union already or other bi- or multilateral agreements facilitate such direct collaboration in potentially sensitive sectors.

There are certainly differences between the preliminarily identified priority sites in terms of knowledge and data availability about the populations of the target species in those areas. However, in all areas intensified research and continuous monitoring are required for better understanding the status of the migratory mammals, the threats to their survival and the actions needed for their conservation. Research and monitoring activities should at least be coordinated and results be shared in a format, which allows for practical use. Joint transboundary research and monitoring can be particularly useful for understanding population dynamics, spatial and temporal patterns of transboundary migrations and ecological and land-use factors impacting on the target species.

Border fences are an important problem for transboundary conservation of the target species in 11 out of the 17 sites listed in 5.1 with priority 1-7. Also in several of the 17 sites of lower priority, border fences form barriers to the animals' movements. In critical areas the prevention of new border fence construction and the mitigation or even removal of existing fences is the most important need for maintaining the transboundary character of the populations of the target species, allowing them to migrate to critical habitats, to maintain genetic connectivity and allow for recolonization of areas where a species locally

disappeared. A special focus on fences is therefore important in many areas, although also other conservation activities can be meaningful for improving the status of target populations, where border fences currently cannot be addressed.

Any attempts regarding border fences require the development of trust and commitment of the border security and customs control authorities and typically high-level political support. In countries, which are Parties to CMS, the Convention can become a vehicle for facilitating such processes. The purpose of border fences can vary and it is important to understand these purposes to be able to provide justified and targeted solutions, which as much as possible take into account these purposes. Some border fences may have the purpose of restricting movements of humans, pedestrians as well as of motorized transportation. These are hard to modify, but in remote areas gaps in fences, equipped with modern surveillance, can be an option. Fences for preventing only the crossing of motorized transport are easier to modify to become passable for wildlife while still fulfilling its purpose. In some areas fences have been erected for the prevention of livestock movements in the first place. Here, modifications of the height and type of the lower wires can be useful. Detailed recommendations on the mitigation of border fences are provided by Olson (2013).

Illegal hunting is an issue in most if not all identified areas and should be addressed with highest priority. Beyond the immediate effect of increased mortality, illegal hunting is a disturbing factor, which causes that large areas of otherwise suitable habitat are avoided by the target animals. This affects their overall condition, survival and recruitment. Prevention or reduction of poaching is therefore a precondition for the success of other conservation action. Which means are suitable for achieving this depends on the specific conditions with regard to the target species, their population characteristics, drivers of illegal take, legal and institutional frameworks, enforcement capacities and attitudes of stakeholders. Potential approaches, which often can be and need to be combined, include: improved enforcement by government rangers through increase in staff numbers, better equipment and rewards; improved protected areas in terms of area size, staff, financial and technical basis; community-based and other systems of sustainable legal use in assigned areas; training and equipment of customs services to intercept illegal trade and others. All these approaches can benefit from transboundary collaboration. Border guards can sometimes be involved in poaching, particularly in remote areas. Their involvement, however, is crucial in transboundary prevention of poaching.

Overgrazing and livestock with its effects of forage competition, habitat degradation, displacement and disease transmission are significant threats in nearly all priority areas with very few exceptions. The CAMI PoW 2014-2020 provides a set of activities to address livestock related issues. These activities should be applied as needed and adapted to the site-specific conditions. Of particular importance are the development of approaches facilitating and incentivizing the coexistence of wildlife and other land-uses, including livestock grazing, and the establishment of permanent or temporary grazing-free areas. Traditionally in many transboundary areas, grazing took place across nowadays' national borders. Looking into grazing systems from a transboundary perspective may show opportunities for landscape level grazing management in a way that also benefits wildlife. Such approaches can only be implemented where veterinary and other regulations permit for this.

Industry, mining and infrastructure development are relevant threats in several of the priority areas, e.g. in the context of China's Belt and Road Initiative, or through the expansion of extractive industries. Transboundary impacts should be considered in the context of the Environmental Impact Assessments. Avoidance, mitigation and compensation of adverse impacts on migratory mammals require the consideration of transboundary aspects.

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Annex

TOR for the Consultancy

Result of Service

1. A set of key trans-boundary conservation areas in the CAMI region with a description of each area and why it is important for which species and how more effective conservation of this area will benefit the species;
2. Set of recommendations for progressing transboundary cooperation and effective conservation of those areas and their wildlife populations;
3. Provision and preparation of information and data on those areas and populations to be used for producing maps to guide decision-makers in strengthening trans-boundary cooperation.

Work Location

Remote

Expected duration

To deliver the tasks and products mentioned above, the consultant will work up to a total of 40 days over 8 months, with the following proposed timetable:

1. Submission of the draft list of trans-boundary conservation area, description and assessment to the CMS Secretariat for comments: 15 February 2019
2. Comments by the CMS Secretariat on the draft report: 30 February 2019
3. Submission of the final report to the CMS Secretariat: 15 March 2019
4. Presentation of the study and its findings at an international workshop: April 2019
5. Incorporate any comments made at the workshop and finalize the document for submission to the CMS Scientific Council and COP13: June 2019

Duties and Responsibilities

ORGANIZATIONAL SETTING

The Convention on the Conservation of Migratory Species of Wild Animals (CMS) is a multilateral biodiversity related treaty whose secretariat is administered by the United Nations Environment Programme (UN Environment). CMS aims to comprehensively address the conservation, including sustainable use, of terrestrial, aquatic and avian migratory species and their habitats across their respective ranges.

The Central Asian Mammals Initiative (CAMI) was developed to strengthen the implementation of CMS in the wider Central Asian region and promote internationally coordinated action to achieve and maintain a favourable conservation status of 15 large mammal species throughout their range covering 14 countries. A comprehensive Programme of Work 2015-2020 was developed under CAMI and adopted with Resolution 11.24 by the Eleventh Meeting of the Conference of the Parties (COP11) in 2014. The CAMI coordinator is based in the Terrestrial Species Unit of the CMS Secretariat in Bonn, Germany.

At the Midterm Review Meeting of CAMI, held on April 16-19, 2018, on Vilm Island, Germany, participants recommended to focus on the promotion of transboundary conservation as a main priority within CAMI until 2020. It was recommended to identify and analyse trans-boundary conservation hotspots of major importance to CAMI species in the region and develop recommendations for their conservation, building on existing projects and

information available within CAMI. In addition, CMS Resolution 12.7 on the role of ecological networks for the conservation of migratory species also reinforces the commitment of CMS Parties to protect trans-boundary habitats.

DUTIES AND RESPONSIBILITIES

Building on the CAMI migration and infrastructure atlas, to be finalized in 2018, which compiles information on distribution of and threats resulting from linear infrastructure to populations of CAMI species, and under the supervision of the CMS Secretariat and the CAMI Coordinator, the consultant will be responsible for the following duties:

1. Identifying key trans-boundary populations of each of the species covered by CAMI and of the associated transboundary areas (TAs):
 - a. Researching available literature and data on species distribution and the relevant TAs;
 - b. In close consultation with the CMS Secretariat, liaising with the CAMI Species Focal Points and government focal points in the region, relevant IUCN Specialist Groups, experts and NGOs to obtain information on species distribution and movements, important transboundary populations and areas;
 - c. Compiling a list of the transboundary populations of each species and of the associated transboundary areas;
 - d. Identifying and analysing TA-specific threats to these populations and respective conservation needs;
 - e. Analysing and listing current and existing work and initiatives that are already ongoing and/or planned to enhance the conservation of species in those TAs as well as main decision-making bodies and stakeholders in respective countries;
2. Undertaking an initial prioritization and selection of TAs according to conservation importance and feasibility:
 - e. Assessing the importance of each area for the respective species,
 - f. Assessing the need, urgency and feasibility for implementing conservation action in each TA;
 - g. Considering the requirements for implementation of CMS instruments and mandates (CAMI Programme of Work, Resolutions and Decisions), as well as other existing agreements and trans-boundary projects;
 - h. In cooperation with the CMS Secretariat, liaising with the National Focal Points in the range states for information on existing efforts to strengthen transboundary conservation and inquire about their interest and overall feasibility to enhance cooperation in those areas;
3. Assessing the feasibility of implementing effective transboundary cooperation to enhance conservation of those transboundary populations and areas;
4. Developing a set of key recommendations for promoting cooperation and transboundary conservation of the most important TAs in the context of CMS and CAMI;
5. Presenting the findings at an international workshop to be held in April 2019, which will discuss and review the findings of the study and complete exercise 2 above and incorporating the results of the workshop into the final updated product.
6. In cooperation with the CMS Secretariat, providing the gathered information for and guiding the process of producing maps of the selected TAs (to be accomplished under a different assignment after the workshop), and ensuring accurate representation of the collected information and compatibility with the existing migration and infrastructure atlas.

WORK LOCATION

Home-based (remote work).

Qualifications/special skills

Academic Qualifications: Advanced university degree (Master's degree or equivalent) ideally in an environmental related discipline. A first-level university degree in combination with relevant work experience may be accepted in lieu of the advanced university degree

Experience:

- A proven track record in the ecology of one or several CAMI species and/or conservation policy in Central Asia;
- Knowledge of CMS and its instruments, its functioning and operation as well as coordination requirements;
- Experience with and/or knowledge of transboundary conservation approaches on the ground, ideally in the CAMI region;
- Experience and competence in communication and consultation with a wide range of stakeholders including scientists, conservationists and Government representatives;
- Excellent interpersonal, communication and presentational skills (spoken and written) in English and Russian;
- Proven ability to collect, compile, analyze and synthesize complex information and process this information to be understandable for the general public as well as for decision makers;
- Excellent report-writing skills.

Language: Fluency in English and Russian