



CONVENTION ON MIGRATORY SPECIES

UNEP/CMS/BKD/TW1/Outcomes/Annex 1

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TECHNICAL WORKSHOP UNDER THE
MEMORANDUM OF UNDERSTANDING CONCERNING
CONSERVATION AND RESTORATION OF THE
BUKHARA DEER (*Cervus elaphus bactrianus*)
Online, 19-22 October 2020

OUTCOMES OF THE MEETING

ANNEX 1: BUKHARA DEER OVERVIEW REPORT

(Prepared by the UNEP/CMS Secretariat)

I. INTRODUCTION

1. The Memorandum of Understanding Concerning Conservation and Restoration of The Bukhara Deer (*Cervus elaphus bactrianus*) (Bukhara Deer MOU) was signed by Kazakhstan, Tajikistan, Turkmenistan as well as WWF Russia during a special event of a meeting of the Inter-State Sustainable Development Commission (ISDC) in Dushanbe, Tajikistan, on 16 May 2002. The Republic of Uzbekistan signed the MOU on 18 September 2002 through its Ambassador in Germany, and the International Council for Game and Wildlife Conservation (CIC) signed the MOU as a cooperating organization. While the MOU was signed by four Bukhara Deer Range States, the First Meeting of the Signatories to the MOU in 2011 recognized Afghanistan as an additional Range State and invited the country to sign the MOU.
2. Pursuant to paragraph 5 of the MoU, the Secretariat shall prepare an overview report ahead of a MOS compiled on the basis of information at its disposal pertaining to the Bukhara Deer (*Cervus elaphus bactrianus*). This report was prepared by WWF Russia, Central Asia Programme on behalf of the CMS Secretariat with generous funding from the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety / Federal Agency for Nature Conservation of Germany.
3. National reports of the Signatories to the Bukhara Deer MOU are meant to be the primary source of information for the overview report. National Reports of Uzbekistan and Turkmenistan were utilized for this overview. Due to the absence of National Reports from other Signatories and Afghanistan, the information for these countries was provided by national experts, as well as taken from data of special surveys, completed in the frame of programmes undertaken by the German Gesellschaft für Internationale Zusammenarbeit (GIZ), Michael Succow Foundation and the Wildlife Conservation Society (WCS). Additionally, information available to WWF Russia such as project reports, conference proceedings, scientific literature, grey literature and personal consultations with specialists working in the Range States was included.

II. CONSERVATION STATUS OF THE BUKHARA DEER

4. Evidence shows that after the previous severe decline, the global Bukhara Deer population has been stable since 2002, and an increasing population trend has been continuously observed for all populations since 2011 till present. According to the best available monitoring data, which covers most Bukhara Deer populations, trends for the period 2010-2019 are as follows:
Kazakhstan: >900, increasing;
Tajikistan: >500 – stable/increasing;
Turkmenistan: ~250– stable/slightly increasing;
Uzbekistan: >2000 – increasing, with an overpopulation in Badai-Tugai and Tallyk-Tugai, causing degradation of the ecosystem and the population itself.
5. The high level of habitat fragmentation prevents the deer from naturally expanding their range and population numbers from growing. However, in some parts of the distribution area, especially in the Amudarya river valley, prolonged and high-level floods forced the animals to migrate numerous times during the reporting period out of their natural habitat. As the animals are increasingly hunted outside those areas, this is the major reason for the low level of population growth in Uzbekistan and Turkmenistan, in the middle reaches of Amudarya. It also shows that there is an exchange of animals between the subpopulations of the middle Amudarya

Figure 1.

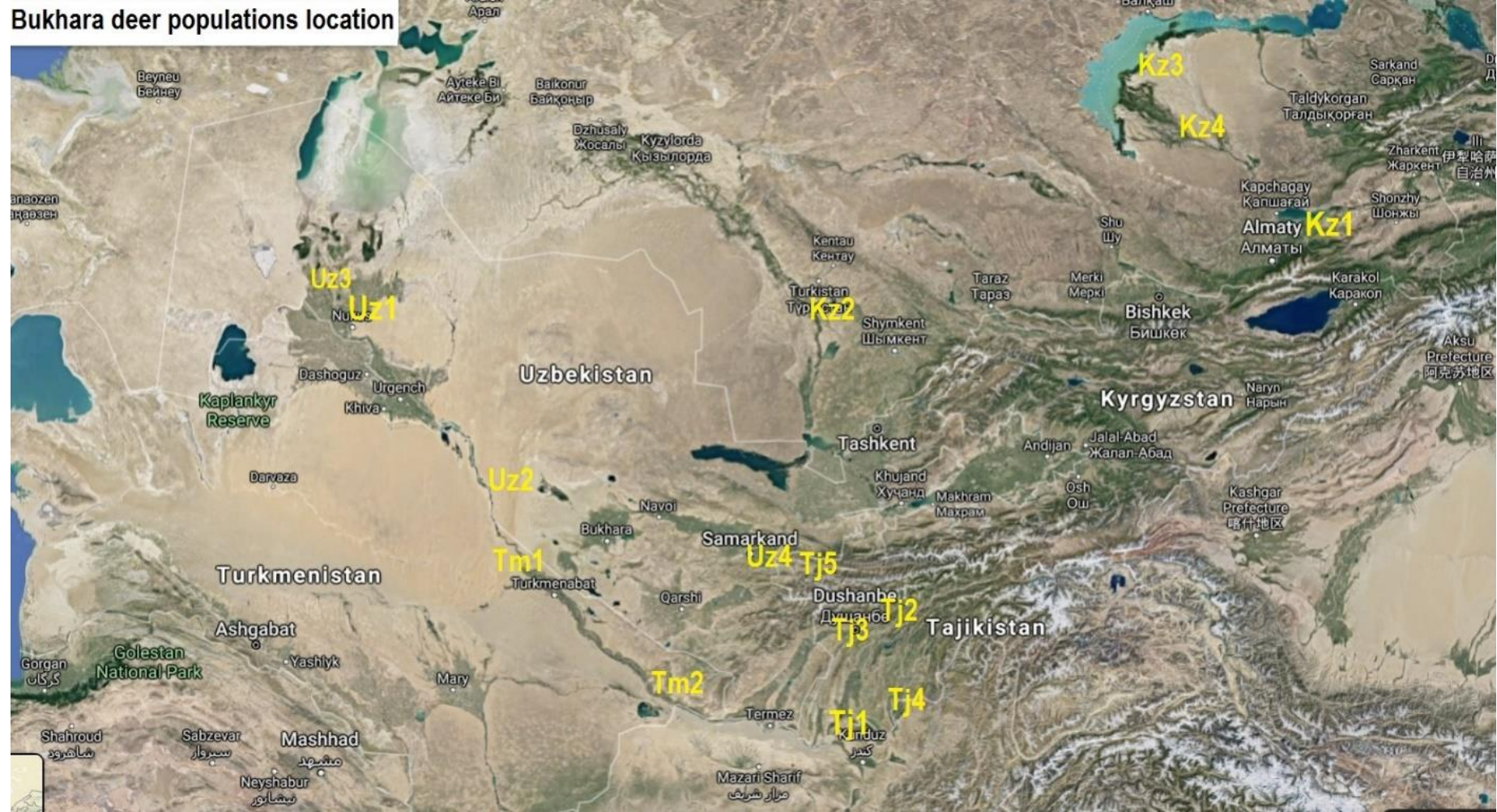


Table 1. Population trends of Bukhara Deer

	Year	Map code	1999	2010	2015	2018	2019	
							free-ranging	captive
KAZ	Karatchingil/surroundings	Kz1	80	350	400	700	715 ¹	
	Turkestan (Syrdarya)	Kz2	0	18 (+22 in pens)	49 (+54 pens)	71 (+85 in pens)	75 ¹	83 ¹
	Ili-Balkhash	Kz3				5	5 ¹	12 ¹
	Middle Ili (private)	Kz4					40 ¹	
	Subtotal		80	390	800	>900	835	95
TAJ	Tigrovaya Balka	Tj1		>150		350	>350 (386 ²)	
	Romit	Tj2				18		25 ²
	Dashti-Dzum	Tj3				8-10?	8-10 ² ?	
	Other territories	Tj4				50?	50 ² ?	
	Zarafshan (upper reaches)	Tj5		60-65		40-50	60-160³	
Subtotal		?	210	400	>500	550	25	
TKM	Middle reaches of Amudarya (7 sites)	Tm1	30	60-70		112	120 ⁴	
	Djarguzer (Amudarya upper reaches)	Tm2	~20	~50	130?	~50-100?	130 ⁵	
	Subtotal		50	120	80?	~200	~250	
UZB	Badai-Tuagai NR / Lower Amudarya BR	Uz1	~100	517+30 in pens		1350- <i>data of national report (or 2112**)</i>	1233 ⁶	18 ⁶
	Kyzylkumskii NR	Uz2	76	~130		120-150	140-150 ⁶	
	Other territories	Uz3	~50	~140-180		200	~200 ⁶	2 ⁶
	Zarafshan (reintroduction)	Uz4	9	~30-32 (+22 in pens)		100 (+24 in pens) +60-150	100 ⁶ +60-150³	24 ⁶
	Subtotal		~190	~900	1500	>2000	~1733-1833	44
TOTAL		~350	1620	2780	3400-3500	~3468-3568	164	

60-150, 40-50 – figures in terracotta – most probably the same animals on the border of Uzbekistan and Tajikistan, included in data for both countries

¹ – data of census completed in 2019 by the specialists of the Institute of Zoology, Kazakhstan, and by the staff of the Karatchingil game management enterprise;

² - data from the State Department of Specially Protected Natural Territories (SDSPNT) of the Republic of Tajikistan

³ - experts evaluation, data from surveys of border guards

⁴ – official National Report; surveys of the staff of the Amu-Daria nature reserve;

⁵ - official National Report; experts' estimations

⁶ - official National Report; census completed by national specialists and the staff of the reserves

⁷ - 2112** – results of census in 2019: Daniel CORNELIS, Valéry GOND, and Régis PELTIER (CIRAD), with participation of Elena KAN (KRASS), 8 January 2020.

Mission report Estimation of Bukhara red deer (*Cervus hanglu bactrianus*) population in Lower Amudarya State Biosphere Reserve

6. Bukhara Deer occur in 7 major populations (Uz1+3; Uz2+Tm1; Tm2; Tj1+4; Uz4+Tj5; Kz1; Kz2) and some additional local reintroduced groups, which are not considered as separate populations yet (Tj2, Tj3, Kz3, Kz4). Most of the populations are located in small subpopulations in the patches of riparian forests along the Amudarya river valley. Natural populations occur in the following areas along the Amudarya:
- (1) Upper reaches: Tigrovaya Balka in Tajikistan (bordering Afghanistan); Djarguzer in Turkmenistan; Maimun-tugai in Uzbekistan;
 - (2) Middle part of Amudarya: Kyzylkum Nature Reserve in Uzbekistan and Amudarya Nature Reserve and non-protected sites of riparian forest (seven in total) in Turkmenistan;
 - (3) In the 1970s, Bukhara Deer populations had been reintroduced in the lower reaches of Amudarya (Badai-tugai) which is now a part of the “Lower Amudarya Biosphere Reserve (LABR)”, which includes a number of additional sites of riparian forests.

Outside of the Amudarya river valley, reintroduced populations of Bukhara Deer can be found in the following areas:

- (1) Zarafshan river valley in Tajikistan (reintroduced in 1970s) and Uzbekistan, Zarafshan State Nature Reserve (reintroduction during the reporting period);
- (2) Ili river valley, Karatchingil (reintroduced in 1970s);
- (3) Dashti-Dzum (mountainous region; introduced in 1970s); some animals still live in the area;
- (4) Romit (mountainous region; introduced in 1970s; eliminated in 1990s); introduction re-started in 2017;
- (5) Middle reaches of the Syrdaria river valley in the Turkestanskii region of Kazakhstan (reintroduction on-going during the reporting period);
- (6) Ili-Balkhash area (reintroduction initiated in the frame of WWF project in 2018; ongoing).

Subpopulations of the upper Amudarya (Tajikistan, Turkmenistan, Uzbekistan)

7. An exact census of the sub-populations in Uzbekistan and Turkmenistan has never been conducted as the populations inhabit territories between engineering systems of state borders and access to these territories is difficult. Some periodic expert estimates suggest a stable population or even slight growth.
8. The largest natural population of Bukhara Deer inhabits the Tigrovaya Balka Nature Reserve (NR) in Tajikistan and adjacent patches of riparian forests on the right bank of Piandj. In the 1960-1970s the population reached its optimum with 350-400 animals, which is the carrying capacity of the habitat. Deer from Tigrovaya Balka were used as a source for reintroduction in various other sites of the historical range of the species, as well as for introduction and the establishment of reserve groups in suitable conditions in mountain areas. All populations in Tajikistan, including those in Tigrovaya Balka and adjacent riparian forests of the Piandj seriously suffered during the period of civil conflicts in the 1990s. Furthermore, disruptions in the water supply regime and natural runoff caused serious damage to the habitat. Since 2007 the water regime in Tigrovaya Balka was greatly restored due to a project undertaken by WWF/MFA Norway, and during the following 7-8 years the situation was improving and resulted in a stabilization and significant growth of the Bukhara Deer population.

9. Tajikistan reported that there were 130-140 deer in Tigrovaya Balka NR in 2010-2011. More recently the population has again reached its optimum size, and currently exceeds 350 deer, inhabiting the riparian forests of the right bank of the Piandj outside the reserve. Additionally, there have been transboundary migrations to Afghanistan. A recent study (Weischet 2019) conducted in a frame of a project of GIZ and Michael Succow Foundation revealed no significant direct threats to the Bukhara Deer population in Tigrovaya Balka other than those affecting its habitat.
10. The data currently available on the population status in Afghanistan is very fragmented. A wildlife survey carried out by the WCS in December 2007 in the riparian forests of the Pianj River in its historical range in Kunduz and Takhar provinces, failed to find any indication that the species was present. A special survey in 2013 detected deer presence in the Darqad - the northernmost district of Takhar Province in northern Afghanistan, which borders the major habitat of Bukhara Deer in Tajikistan. Very recently, the National Environment Protection Agency (NEPA) in Afghanistan has declared Darqad a protected area.

Subpopulations of middle Amudarya (Turkmenistan, Uzbekistan)

11. Populations in Turkmenistan (Amudarya NR) and Uzbekistan (Kyzylkumskii NR), are stable with an increasing trend. There are indirect signs that some animals migrate from one riparian forest area to another, also crossing the river between Uzbekistan and Turkmenistan depending on, *inter alia*, water level fluctuations. According to the latest data there are about 120 deer in total in riparian forest spots of Amudarya State NR and 140-150 deer in Kyzylkumskii NR. This part of the species population is especially valuable from the genetic point of view, as they are original, while all the rest had been reintroduced by translocation of animals, initially originating from Tigrovaya balka.
12. The Bukhara deer population number was not assessed in Amudarya State Nature Reserve in Turkmenistan in the frame of the project implemented by the Michael Succow Foundation in 2015-2017, but habitat surveys were carried out. The habitat characteristics of the tugai forests indicated that the carrying capacity of this habitat was not exceeded through the deer population in terms of feeding conditions. Staff of the Amudarya State Nature Reserve expressed their interest in translocation of deer from the Lower Amudarya State Biosphere Reserve (Uzbekistan) to the riparian forests of the Middle Amudarya (Turkmenistan), the feasibility of which is yet to be determined.

Lower reaches of Amudarya (Uzbekistan)

13. Recently, Baday-Tugay became the center of a new, much larger protected area called the Lower Amu Darya Biosphere Reserve (NABR), which includes several tugay massifs (Baday-Tugay, Tallyk, Jumurtau, Nazarkhan), so relocation and reintroduction can take place within this strictly protected area. Deer have dispersed naturally into the Tallyk and Dzhumurtau massifs. Urgent measures should be taken to relocate part of the Bukhara deer population to the Nazarkhan massif, where the deer cannot disperse naturally, in order to create an additional subpopulation. The infrastructure for deer adaptation after relocation has already been prepared in the two most suitable places - in the Nazarkhan massif, as well as in the recently organized Khorezm National Nature Park.

14. The Bukhara Deer population at the territory of the LABR increases every year due to a lack of natural predators and the absence of an effective wildlife management. This large population, initially developed as a result of reintroduction, is a big success for Uzbekistan's reintroduction efforts. While population growth is a positive sign, overpopulation of deer in a limited forest area has a negative impact on the rejuvenation of the riparian forests ecosystem. Without effective management interventions, the unique riparian forests risk to be seriously degraded and even disappear entirely from this area in near future. Moreover, the overpopulation of Bukhara Deer causes human-wildlife conflicts. The animals ruin adjacent farm fields by eating cultivated cotton, rice, wheat, corn and other agricultural crops. The main conflict zone is located along the territory of the reserve, in the Amudarya and Beruni districts of the Republic of Karakalpakstan. According to Cornelis et al. (2020), the number of Bukhara Deer within the reserve exceeds 2,000 individuals; according to the official report presented by the Republic of Uzbekistan it is 1233 (results of the regular annual census of the reserve staff and specialists of Uzbekistan). In any case, the carrying capacity of the territory is exceeded by the factor 4-5, which is the main reason for the deer to move beyond the riparian forests (Marmazinskaya, 2008; 2018).

Zarafshan river valley (Tajikistan, Uzbekistan)

15. This transboundary population is divided into two sub-populations, one in the Zarafshanskii sanctuary in Tajikistan, where deer were reintroduced in the 1970s, and the other one in Zarafshan State Nature Park in Uzbekistan. Since the number of deer in the Zarafshan State Nature Reserve in Uzbekistan exceeded 50, regular exchange between the subpopulations was registered. Three years ago, a system of engineering constructions was put in place along the border, but there are special passages for deer in the fence, and regular crossing is occurring. In 2020, a border permit was obtained to conduct research, during which it was revealed that, despite the created passages, there are cases of serious injuries and even death of animals attempting to cross the border fence. According to a report prepared by Tajikistan in 2015, there were 40-60 deer on the Tajik side. But the results of surveys of the Tajik population (regular information from border guards) at the border with Uzbekistan shows more optimistic figures: up to 60-160 animals. Most probably, the majority of the animals stay in the area between the engineering systems between the state borders and they are more visible from the Uzbek side.
16. In Uzbekistan, preparations for deer reintroduction in the Zarafshan State Nature Reserve were initiated before the reporting period (1995-97, with WWF Russia project support from 1999 until 2010). The two first groups of in total ten animals were released in 2005 and 2007 (four more animals escaped from the pen). There were 21 deer in the pens and 20 animals in the free ranging group in 2009. The population is currently developing well. According to the recent data, included in the National Report of Uzbekistan, the wild population is estimated to be 100 deer, 24 animals are still kept in the pens, and 60-150 deer are detected outside the reserve, on the border with Tajikistan. (*These animals are given in terracotta text color in Table 1, these numbers are likely to be counted twice by the two neighboring countries and are thus added only once to the total number*). During 2020-2021 the anthropogenic impact on the territory of Zarafshan National Nature Park has increased, there is a lowering of the ground water level and drying of tugai, predation of deer by feral dogs.

Ili river valley (Kazakhstan)

17. Bukhara Deer disappeared from the riparian forests of the Ili River in the middle of last century. A group of deer was brought from Ramit to Karatchingil in the early 1970s to a special game management area (previously state-owned, now private), which includes the riparian forests of the left bank of the Kaptchagai water reservoir in the middle reaches of the Ili. After some years of adaptation, the population developed well and now exceeds 700 deer. The area is very limited and fenced, but the deer (as well as all other ungulates) receive winter feeding, so no ecosystem degradation occurs. A very high population density is causing low reproductive success, and it would be beneficial for the population to translocate a significant number of deer to other suitable habitats, thereby causing higher reproductive success of the donor population.
18. There is information that some deer jump over the fence and expand their range to the surrounding riparian forests of the left bank of Kaptchagai water reserve. But there are no exact data on deer numbers and distribution and according to oral information a significant number of these animals are being poached.
19. By private efforts, a group of deer was established in 2013 in the game management entity Tasmuryr, located in the middle reaches of Ili river. It currently has about 40 deer.
20. Initial activities on Bukhara Deer reintroduction in the Ili-Balkhash region (southern banks of Balkhash) began in 2018. In the frame of the Tiger reintroduction Programme in Ili-Balkhash region (Memorandum between WWF and the Government of Kazakhstan, signed in 2017), WWF Russia has prepared enclosures for deer adaptation, and in December 2018 the first five deer were translocated from the Syrdaria pens to Ili-Balkhash reserve. They were released into nature in 2019, and two females were equipped with satellite collars. Females kept close to the pens for the first several months, but in the middle of winter together with one of the males moved away 100 kilometers from the enclosure. At the beginning of 2020, 13 more females and one male from the Karatchingil were translocated for adaptation to the enclosures of the Ili-Balkhash reserve. Additional animals (up to 250 in five years) are planned to be translocated from Karatchingil to Ili-Balkhash, which will not lead to a decrease of this population, but only to intensification of reproduction.

Syrdaria river valley (Kazakhstan)

21. Bukhara Deer had been numerous in the riparian forests of Syrdaria but disappeared from the fauna of the region in 1962. Deer reintroduction was initiated in the South Kazakhstan oblast, the middle reaches of Syrdaria, before the reporting period. The first group was released in 2009 in the frame of a project by WWF Russia. An additional group was translocated directly from Karatchingil and released in 2010 (Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan. Development of the reintroduced population in the riparian forests of middle Syrdaria is ongoing, there are 75 deer in free-ranging population in the Syrdaria-Turkistan nature park and its surroundings, and 83 in the system of pens, for future releases. It is planned to translocate deer from the pens to far-away spots of riparian forests of Syrdaria, to advance deer population development for the entire Syrdaria valley.

Sites of the species introduction in 1970s

22. A number of Bukhara Deer groups were established in the mountain valleys of Tajikistan in the 1960s. The most successfully developing group in the Ramit Nature Reserve reached a population size of 200-250 animals and was used as a source for further reintroductions in the 1970s (Karatchingil in Kazakhstan; Badai Tugai in Uzbekistan). There had been no sightings of deer in Ramit in the 2000s (the population was practically eliminated during the period of civil conflict) and there was no information available until recently on the Karatag group. In 2017, a new enclosure was built in Ramit and 10 animals were translocated from Tigrovaya Balka. As a result of natural reproduction, there are now 24 deer. There are 8-10 deer in Dashty-Djum sanctuary and 12-15 in Sarykhosor forestry.

III. IMPLEMENTATION OF THE ACTION PLAN

23. This section provides a brief summary on the progress towards the implementation of the MoU and its Action Plan and is structured along the main objectives of the Action Plan.

OBJECTIVE 1: RESTORE RANGE AND NUMBERS

24. Various activities were carried out since the development of the Action Plan, which in total resulted in the growth of deer numbers in the wild from 350 in 1999 and 500 in spring 2002 to up to 3500 in autumn 2019. Deer were reintroduced in 5 sites of the former range (Zarafshan, Syrdaria, Ili, Southern banks of Balkhash, Ramit). About 150 animals are currently still in captivity (24 in Zarafshan, 83 in Turkistan, 18 in Badai-Tugai, 12 –Ili-Balkhash).

1.1 Examination and support of existing nature reserves inhabited by BD populations

25. During the last years, surveys were completed and important technical support provided to the Ili-Balkhash nature reservat in Kazakhstan as a component of the Tiger reintroduction Programme in the Ili-Balkhash region (Memorandum between WWF and the Government of Kazakhstan, signed in 2017), including vehicles, drones, building well equipped ranger stations, border posters and towers for observation; supporting natural forest restoration activities etc. In the Badai Tugai, which became a core area of the “Lower Amudarya Biosphere Reservat” (Uzbekistan), technical support was provided by GEF-UNDP, GIZ (Germany), and Michael Succow Foundation.

1.2 Development of an interstate econet (system of protected areas) which could support self-sustainable population development of Bukhara Deer

Protected areas

26. Several new protected areas have been established during the present reporting period in the Bukhara Deer Range States.

27. **Kazakhstan:** A special sanctuary (site for Bukhara Deer reintroduction) was established in the South Kazakhstan oblast by the regional and state government of Kazakhstan with support from WWF. Additional protected areas were suggested to be established in the Syrdaria river valley (55,000 ha of the middle reaches of Syrdaria and three sites (65,000 ha) in the lower reaches). As a result, Syrdaria- Turkestanskiy Nature Park was established in 2013 covering 120,000.00 hectares and sanctuary of oblast status – covering all the riparian forests on the middle reaches of Syrdaria and its tributaries in Southern-Kazakhstan oblast – 2014-2015 -500,000.00 hectares. Potential Bukhara Deer habitats in the Ili-Balkhash region (in total about one million ha of wetlands) have also been put under protection during the reporting period (three sanctuaries established by the Government of Kazakhstan). The status of the protected areas further improved; the area (1 million hectares) was nominated in 2012 as a new Ramsar site “River Delta and South Lake Balkhash”, Ili-Balkhash State Reservat was established in 2018, covering 415,164.20 hectares.
28. **Uzbekistan:** In Uzbekistan, 110,000 hectares of tugai forests are currently preserved (National Bukhara Deer Report, 2018). Protected areas occupy 31,031.7 hectares (only the protected and buffer zones were taken into account in the calculation for the LABR). Thus, protected areas cover 28.2 percent of the territory of suitable habitats. Existing protected areas with Bukhara Deer are: Kyzylkum reserve 10,311 hectares total of which 5,338 forests; Zarafshan State Nature Reserve (previously Zarafshanskii Zapovednik): 2,426.4 hectares; Khorezm National Natural Park: 21,687.5 hectares, including riparian forests Yangibazar - 743.2 hectares and Urgench - 197.0 hectares.
29. In September 2011, through a decision of the Cabinet of Ministers of the Republic of Uzbekistan, a new “Lower Amudarya state Biosphere Reservat” was established, with a total area of 68,717 hectares. It includes Badai Tugai Zapovednik and the riparian forests of the Berunijskii and Amudarijinskii regions. Currently, work was in progress to expand the network of protected areas. In 2021, the state reserve "Sudoche-Akpetki" 280,507 hectares was established, it is planned to consider the creation of the protected natural area "Muzrabat" in the floodplain of the Amu Darya River near Termez, as well as the already existing forestry and hunting farm "Dalverzin" 5,360 hectares - all these areas are potential places for releasing deer into the wild.
30. **Tajikistan:** The territory of the Tigrovaya Balka Nature Reserve increased when 11,000 hectares were added mainly from the adjacent deserts by a decision of the Government of Tajikistan in 2007. The process of approval by local administrations and the legal land allocation was finalized (WWF/MFA Norway project support). Unfortunately later, instead of becoming an additional protected habitat for deer and other animals, the majority of this territory was granted on lease to a Chinese agricultural company (thanks to improving water supply of the reserve in the frame of WWF project, this area became suitable for irrigated agriculture, and commercial structures became interested in those lands). Bukhara Deer introduction began again in 2018 in the nature reserve Ramit (introduction in a mountain valley, successful in 1970s, but all deer eliminated in 1990s during civil conflict), and is planned to be renewed in Dashti-Djum sanctuary as well.

31. **Afghanistan:** Recently the National Environmental Protection Agency (NEPA) has declared Darqad in Takhar province and Imam Sahib in Kunduz Province protected areas on 7 June 2020. So far, both protected areas have received limited protection on the ground mainly because of lack of funding and until recently significant security issues (particularly in Imam Sahib). However, NEPA with its partners is exploring funding opportunities from various foreign aid, for the management of these protected areas. A survey done by NEPA and WCS had detected Bukhara Deer in this area in 2013.
32. Following Econet design (GEF/UNEP/WWF project, 2003-2006) and WWF-ISDC (Inter-State Sustainable Development Commission in Central Asia) Agreement on model Econet implementation (2007), development and model establishment of Econet clusters was continued in the region in e.g. in Bukhara Deer habitats in the reporting period: Middle reaches of Syrdaria (2012-2015), Ili-Balkhash (2018) in Kazakhstan.

1.3. Restoration of the species in suitable habitats with special measures for protection and favourable conditions for reproduction

33. Related activities are ongoing in Zarafshan (Uzbekistan), in Turkistan - Middle Syrdaria, Ili-Balkhash -Kazakhstan, and Ramit (Tajikistan). One release took place in Altyn-Emel, Kazakhstan.
34. A successful captive breeding programme was established in Zarafshan in Uzbekistan and in Turkistan-Kazakhstan in order to increase the number of deer and prepare groups for releases (with support of WWF). The activities in Zarafshan started earlier (there were already 18 deer in the pens in 2002) and were developing quickly and first releases were possible in 2004. In 2005, the permission was received to release the first group; the second was released in 2007. Recently, there are 24 deer in pens in Zarafshan, Uzbekistan for further reproduction and future releases.
35. In Turkistan, the first four deer were transported to the system of pens in 2002 with support of WWF. However, the deer had to be evacuated to the Shimkent Zoo because of the threat of flooding. The system of pens was upgraded and deer returned after one year, but the two additional transportations caused death of some animals. However, once the remaining animals adapted to their new surroundings, their number increased greatly until 2008 (since 2007 with an important financial support from the regional authorities). The first group was ready for release in 2009. An additional group was translocated directly from Karatchangil and was released in 2010 with governmental funding and management of the whole procedure. Now the free ranging population is estimated at 73 animals, and there are 83 in the system of pens for further reproduction and future releases both in the surroundings of the enclosures and for translocation to other sites along Syrdaria.
36. There are 18 deer in the pens of Badai Tugai, Uzbekistan. These animals can be used for translocation to new riparian forest sites, as direct releases from the pens make no sense because the habitats around are already overpopulated.
37. In 2018, a couple of deer was translocated to Bukhara breeding center "Ecocenter Djeiran" but no reproduction registered yet.

38. In the Amu Darya Nature Reserve, Turkmenistan, there are 3 individuals - a female and 2 males, in the National Museum of Wildlife of the Khyakimlik of Ashgabat there are 3 individuals of Bukhara deer. Reproduction has not yet been recorded.
39. In 2017, a new enclosure was built in Ramit, Tajikistan, and ten animals were translocated from Tigrovaya balka. As a result of natural high level reproduction in good conditions, the number of deer in Ramit was 18 animals in 2018 with 24 deer in 2020. Deer are kept in pens for further reproduction and releases into the wild.
40. In the frame of the Tiger reintroduction programme in Ili-Balkhash region, WWF has prepared enclosures for deer adaptation. In December 2018, the first five deer were translocated from the Syrdaria pens to Ili-Balkhash reserve. They were released to nature in 2019 and two females were equipped with satellite collars. Females kept close to the pens for the first months, but in the middle of winter together with one of the males moved away 100 kilometers from the enclosure. At the beginning of 2020, 13 more females and one male from the Karatchingil were translocated for adaptation to the enclosures of the Ili-Balkhash reserve. It is not planned to keep deer in the pens in Ili-Balkhash longer than necessary for adaptation, but for direct releases. Additional deliveries of significant numbers of animals are planned in subsequent years, and such capture in Karatchingil will not lead to a decrease of this population, but only to intensification of reproduction.

Objective 2: Reduce mortality

2.1 Legal protection measures

2.1.1 Ensure that BD is strictly protected by law and that legal instruments for the protection of the species and its habitats are being implemented

41. Bukhara Deer is included in the Red Data Books of all Range States, which means that they are strictly protected.
42. In 2016, the Guide of the Export-Import of Objects of Animals and Plants was released in Uzbekistan. This manual contains information on international and national legislation regarding the import and export of animals and plants, a short guide, as well as a list of the main species included in CITES and the Red Book of Uzbekistan. One of the sections is dedicated particularly to Bukhara Deer. The Guide was distributed free of charge among customs officials and employees of environmental protection authorities.
43. National programmes for the conservation and restoration of key rare species are regularly developed, officially approved and funded by the Government of Kazakhstan. A scientific background and biological rationale for the reintroduction of Bukhara Deer in Kazakhstan for 2018-2020 were prepared by the Institute of Zoology of Kazakhstan in cooperation with WWF, the Association on the Conservation of Biodiversity of Kazakhstan (ACBK) and Center for Remote Sensing and GIS "Terra".
44. A concept on Bukhara Deer conservation in the Republic of Tajikistan was prepared and passed to the relevant Governmental authorities in 2014. In spite of the frequent rotations and changes of responsibilities for protected areas and rare species, important measures aiming on implementation of this concept are already undertaken (e.g. in Romit) or planned for the nearest future (e.g. in Dashyi-Djum).

45. An Agreement between the State Committee of Turkmenistan for Environmental Protection and Land Resources and the State Committee of the Republic of Uzbekistan for Ecology and Environmental Protection on cooperation in the field of environmental protection and sustainable development, was signed on May 20, 2017 in Turkmenbashi.

2.1.2 Enhancing anti-poaching measures

46. Special technical support was provided to the rangers of nature reserves that are inhabited by Bukhara Deerthrough WWF projects in 2000-2012 and from 2018 until recently – to Ili-Balkhash reservat. Special training sessions for rangers were organized (Turkmenistan, Kazakhstan) and an incentive programme for rangers implemented. There is unconfirmed information on deer poaching in the surroundings of Karatchingil as animals are jumping over the fence of the game reserve. In general, mortality is on a low natural level in almost all populations, without epidemics even in such populations with extremely high density, such as Badai Tugai.

2.2 Inventory works in existing populations.

47. Inventories were completed before the beginning of the reporting period and regularly during the period 2000-2012 with monitoring of the majority of populations (see Table 1). The majority of this monitoring was carried out in the frame of a project of the Large Herbivore Initiative in 2000, a WWF project in most parts of the areas, and with funding from the Kazakh Government in **Kazakhstan** (Karatchingil) starting in 2000 until today.
48. In Uzbekistan, regular monitoring is conducted by employees of NABR, Kyzylkum Nature Reserve and Zarafshan National Nature Park. In 2019 with the support of GIZ and CIRAD (Agricultural Research for Development) a survey was completed in the frame of the project “Ecosystem-based land use and conservation of ecosystems at lower reaches of Amudarya“ funded by Germany.
49. In **Tajikistan**, regular monitoring is completed by the staff of the reserve, using a methodology developed in the frame of WWF projects. In 2018, a feasibility mission in the framework of the project “Ecosystem-based Adaptation to Climate Change in High Mountainous Regions of Central Asia for the Tigrovaya Balka Strict Nature Reserve”, funded by the German International Climate Initiative and implemented by GIZ and Michael Succow Foundation provided the results of the latest survey.
50. In **Turkmenistan** regular monitoring is carried out by the staff of Amudarya nature reserve (middle reaches of Amudarya). For many years there are no data on the deer population in Djarguzer (Amudarya upper reaches). In **Afghanistan**, in December 2007 a wildlife survey carried out by the WCS in the riparian forests of the Pianj River in its historical range in Kunduz and Takhar provinces failed to find any indication that the species was present. Later, a special survey completed with the support of WCS in 2013 proved presence of deer in the habitats, bordering with Tajikistan.
51. Within the framework of the project to develop the Central Asian Mammal Migration and Linear Infrastructure Atlas, the impact of linear infrastructures on Bukhara Deer migration was studied (UNEP/CMS CAMI 2019).

2.3 Inventory works in deer habitats to identify areas still suitable for the deer

- 52 Inventories were conducted on a large scale within the GEF/UNEP/WWF Econet project and in more detail at the local level within the GEF/UNDP, GIZ / M. Succow Foundation / CIRAD projects in the lower reaches of the Amu Darya, Uzbekistan. Further inventories were conducted in the various sites of the Uzbek part of Syrdaria (Gosbiocontrol and Committee of game management and protected areas); in the middle and lower reaches of Syrdaria in Kazakhstan (WWF-MFA Norway project); and in the Ili-Balkhash region (Institute of Zoology and the Forestry and Hunting Committee of Kazakhstan, with additional special surveys undertaken within a WWF project in 2010-2011); in lower reaches/delta of Syrdaria by ACBK, Kazakhstan. In Tajikistan, an inventory was completed in 2013 for the draft document "Concept for the conservation and restoration of the Bukhara deer in the Republic of Tajikistan", prepared by a team under supervision of the State department on Specially protected natural territories of the Forestry Agency under the Government of the Republic of Tajikistan with the support of UN Regional Program on Sustainable Use of Natural Resources in Central Asia.
53. In 2012-2015, inventories of the habitats of Bukhara Deer in the Amu Darya valley were carried out, as well as inventories to identify suitable places to translocate deer outside the riparian forests of the Amu Darya river valley, including the valleys of the Murghab and Tejen rivers, as well as the Karakum river (former Karakum canal) and canals. Unfortunately, in many places there is still a lack of sufficient vegetation as forage resources and suitable conditions for deer habitats.

2.4 Increase public awareness

- 54 Various forms of activities were initiated in all countries, mostly with children (schools, ecological clubs), including competitions of paintings and compositions, practical support (such as collecting of acorns and/or brooms as winter forage for deer in pens in Uzbekistan); kids ecological camps and "training of trainers"; preparation of special newsletters and exhibitions. Various education materials were produced for kids of different ages and widely distributed in national languages; various performances were prepared by children for other schools and for adults. Education centers and exhibitions were organized in various protected areas (Zarafshan State Nature Reserve in Uzbekistan, Amudarya State Nature Reserve in Turkmenistan, Tigrovaya Balka in Tajikistan, Karatausskii zapovednik/ Syrdaria-Turkistan Nature Park, Ili-Balkhash Reservat, in Kazakhstan).
- 55 Information on Bukhara Deer project activities was presented on the websites of CMS and WWF. Special sites of the Tigrovaya balka reserve, Zarafshan State Nature Reserve and videos devoted to Bukhara Deer were prepared (e.g. NGO Eremurus, Uzbekistan). Dozens of publications in national and local mass-media, radio and TV broadcasts were devoted to Bukhara Deer conservation in each of the countries every year. The book "Bukhara Deer in Uzbekistan" in Uzbek and Russian (supported by LHF/WWF) was published as well as a booklet devoted to the anniversary of Tigrovaya Balka. Another booklet "Bukhara Deer– National Destiny of Uzbekistan", was published in Uzbek, Karakalpak and Russian (within the framework of the UNDP project). In Uzbekistan, a calendar of ecological dates was published, a wide set of various Ecological Days celebrations organized in LABR, education materials on Bukhara Deer are presented in the visiting center of LABR. In Tigrovaya Balka (Tajikistan) and Turkestan (Syrdaria, Kazakhstan) local NGOs and school kids clubs are an important component of ecological education. Many public awareness activities and practical actions are devoted to Bukhara

Deer. Since 2018 in Ili-Balkhash Reservat (Kazakhstan) major education and public awareness activities are devoted to tiger and to Bukhara deer. Summarizing the experience of captive breeding/reintroduction, the publication “Technical guidelines for restoration and reintroduction of the Bukhara Deer in its natural environment” was prepared and published in 2012¹.

2.5 Economic measures

- 56 In the lower reaches of Amudarya, GIZ, Michael Succow Foundation, and the State Forest Committee of the Republic of Uzbekistan with the participation of the NGO KRASS implemented the project “Ecosystem based land use and conservation of ecosystems at lower reaches of Amu-Darya” which provided various forms of support to local communities for introduction of various forms of sustainable nature resource use in the surroundings of deer habitats. Since 2018 small grants are provided in the frame of WWF project to local communities of the Ili-Balkhash region, in order to decrease anthropogenic pressure on the Bukhara Deer habitats. Ecological tourism is developed in Zarafshan national nature park as an additional source of income for the reserve and local residents and as an alternative to different forms of violation of nature conservation legislation in deer habitats. A survey to research deer-human interaction and develop management recommendations was carried out in Lower Amudarya by national experts of Uzbekistan with the support of GIZ and Michael Succow Foundation.

2.6 Project on deer antler farming development

- 57 No special activities were undertaken, although at least in Uzbekistan possibilities exist because of the overpopulation of deer in Badai Tugai. There is one case private game management entity called Tasmuryn in the middle reaches of Ili, Kazakhstan where deer were purchased and successfully bred, but still not used for any antler farming purposes.

Objective 3 Enhance international co-operation

International agreements

58. No additional international or bilateral agreements were developed nor signed to support MoU implementation.

3.1 Improve exchange of information and technical expertise

59. To some extent this was accomplished through a WWF project, which was implemented in Turkmenistan in 2000-2009, in Kazakhstan and Uzbekistan from 1999-2012, and in Kazakhstan since 2018 until recently, in Tajikistan since 2000 till 2012. A WWF representative regularly participated in the ISDC meetings as an observer and presents the results of the ongoing projects. Some information on the projects is also available at the WWF Russia website.
60. During the next years information was regularly presented during CMS meetings in the frame of the Central Asian Mammals Initiative (CAMI), e.g. on the CMS-CAMI Linear

¹ Russian: <https://wwf.ru/resources/publications/booklets/technical-guidelines-for-restoration-and-reintroduction-of-the-bukhara-deer-in-its-natural-environment/>
English: <https://wwf.ru/en/resources/publications/booklets/technical-guidelines-for-restoration-and-reintroduction-of-the-bukhara-deer-in-its-natural-environment/>

Infrastructure Atlas or the CAMI Newsletter. Besides that, IUCN tools² were used for information exchange. All relevant information is now presented on IUCN site (www.iucnredlist.org).

3.2 Raise funds for conservation programmes

61. Implementation of the action plan was supported through the governments of Range States and a number of organizations. In addition to regular funding provided by all Range States for the areas inhabited by Bukhara Deer, financial support could be secured during the reporting period in the frame of projects by GIZ, Michael Succow Foundation, WCS and WWF Russia (project on Bukhara Deer reintroduction in Ili-Balkhash as a component of the Programme of Tiger restoration in Kazakhstan).

Additional measures, not covered by the Action Plan

Habitat restoration

62. The Action Plan under the MoU does not include a special component on habitat restoration. Nevertheless, the Government of **Kazakhstan** conducted various measures to restore important riparian forests in the Syrdaria river valley. They reduced the water take-off from Syrdaria and built a dam to separate the two parts of the Aral, which helped to restore the “Small Aral” to a great extent. In addition, gas for heating and cooking was provided to local communities in order to prevent them from illegally logging firewood. As a result, the water regime of the Syrdaria provides conditions for natural riparian forests restoration in the river valley. Besides that, planting of Asiatic poplar and silverberry are conducted in suitable sites of Syrdaria Nature Park by the State Forestry. Since 2018 activities of riparian forests restoration (establishment of special nurseries, planting Asiatic poplar, silverberry, willow) in Ili-Balkhash region were initiated in the frame of the Tiger reintroduction Programme in the Ili-Balkhash region.
63. In **Uzbekistan and Turkmenistan**, in the framework of a project funded by Germany and implemented by the Michael Succow Foundation, in 2015-2017 in cooperation with local communities and the local NGO “KRASS”, site specific tree plantations with natural varieties but various functional purposes were established. Along farms at the border between Lower Amudarya Biosphere Reservat (LABR) core zone (strictly protected) and the economic zone, hedges and shelterbelts were planted with the support of the Beruni forestry enterprise and local land users, with a total area of 8.8 hectares, 32,000 seedlings, for various ecosystem supporting purposes but most of all to reduce the Bukhara Deer intrusion on agricultural fields. The success of the so called “green fences” approach has been evaluated in the follow up project funded by Germany and implemented by Michael Succow Foundation and came to manifold conclusions. Keeping lessons learnt and a monitoring survey with management recommendations, that are considered in the LABR management plan 2020-2024 (Gritsina et al. 2020; Koshkin 2020), and can become an important component in solving the serious problem of the Bukhara Deer overpopulation in LABR. In the Zarafshan river valley, water is being supplied to the riparian forest zone of the protected area, local species of shrubs and trees are planted in areas where vegetation was previously destroyed by logging and fires. Employees of the Amudarya and Kaplankyr reserves (Turkmenistan) are planting trees (poplar -turanga, silverberry -

² IUCN red deer Assessment (Assessment by: Brook, S.M., Donnithorne-Tait, D., Lorenzini, R., Lovari, S., Masseti, M., Pereladova, O., Ahmad, K. & Thakur, M. View), which resulted in subdivision of *Cervus elaphus* sp. into three separate species – *C. elaphus* – European forms, a number of subspecies; *C. canadensis* – Asian and American subspecies, and *C. hunglu* – with three subspecies, including Bukhara Deer- *C.h.bactrianus*.

dzhida, etc.) along the channels going to the Turkmen lake "Altyn Asyr" in order to create suitable habitats for the introduction of the Bukhara deer in the future.

IV. Threats to BD populations

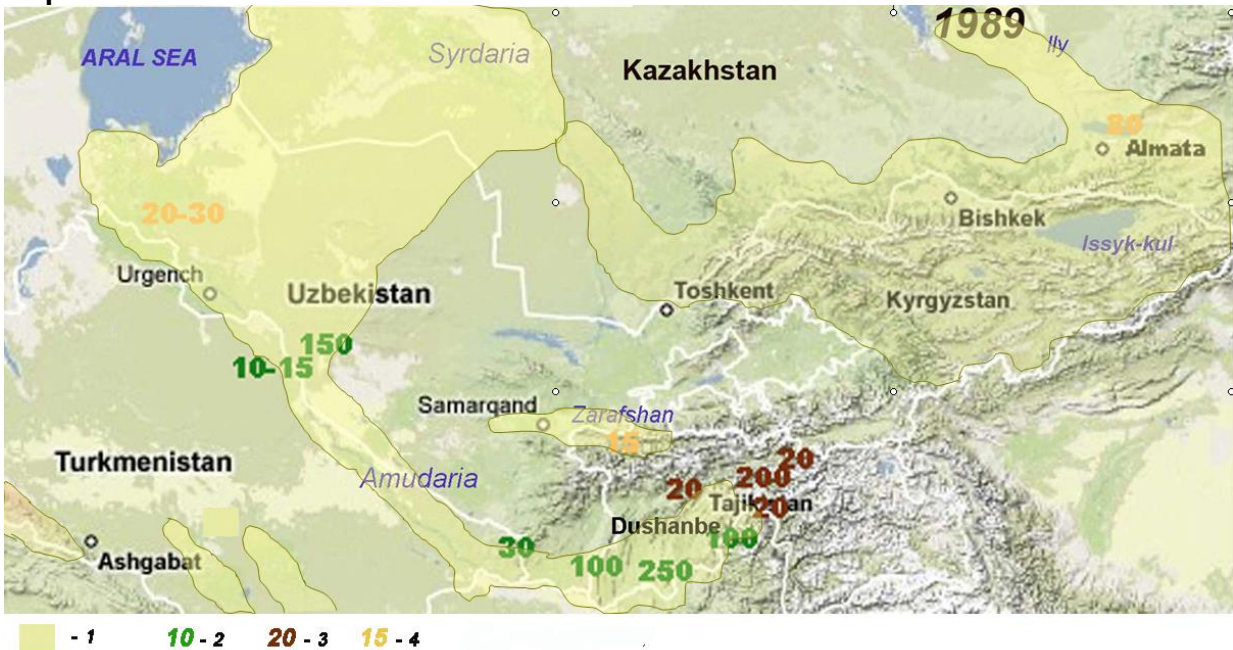
64. Despite the long-term implementation programme and the increasing trend of Bukhara Deer population in the region, the following threats are still relevant:
- fragmentation of habitats;
 - degradation of habitats (even inside of protected areas in case of weak management);
 - climate-change impacts on habitats;
 - illegal logging and livestock grazing;
 - fires, especially artificial fires in reeds bushes (as a livestock breeding tool), which burn not only reeds, but also forests;
 - ecological disasters (floods/droughts), linked to the artificial regulation of the water regime and climate change;
 - poaching, especially outside the protected areas;
 - physical barriers to movement and migration of animals within countries
 - linear constructions, e.g. construction of engineering border systems that are left unmitigated and special passes for deer are neither implemented nor planned;
 - local overpopulation: threat of mortality caused by zoonosis, lack of forage resources (e.g. in the lower reaches of Amudarya);
 - pollution of habitats (from fields, factories);
 - predators (feral dogs, wolf, jackals).

V. EVALUATION

65. It can be concluded that the situation of Bukhara Deer has stabilized since most populations are stable and growing. The total numbers of Bukhara Deer increased from a low of 350 in 1999, to 500 in spring 2002, to up to 1,600 in autumn 2010 and, to more than 3500 in 2019. Initial measures for site restoration and reintroduction are ongoing (Zarafshan, Syrdaria, Ili and Romit). Bukhara Deer habitat restoration in Tajikistan can be considered as an important success for the implementation of the Action Plan through major support of WWF. A great deal of effort allowed to significantly raise public awareness about the situation of Bukhara Deer in the Range States. Nevertheless, additional measures are needed to improve transboundary cooperation and management of Bukhara Deer populations. It would be useful to initiate reintroduction in new sites in Ili and Syrdaria river valleys, in various sites in Tajikistan and Uzbekistan. In addition, transfer of deer from Badai Tugai is very urgent in order to prevent further overpopulation, population degradation and mortality of deer due to a variety of reasons.
66. For the long-term survival of the species, it will be important to focus attention on the connectivity of habitat and to facilitating the safe movements of deer outside and between key habitats and protected areas. Solutions of co-existence with infrastructure development, local communities and overall land use planning need to be fostered and implemented.

ANNEX

Map 1. Bukhara Deer distribution and numbers in various sites in 1989



- 1- historical area of Bukhara Deer(after Heptner, et.al, 1961)
- 2 - numbers of deer in natural populations
- 3 - numbers of deer in introduced groups (mountain populations)
- 4 - numbers of deer in reintroduced groups (natural habitats)

Map 2. Bukhara Deer distribution and numbers in various sites in 1999



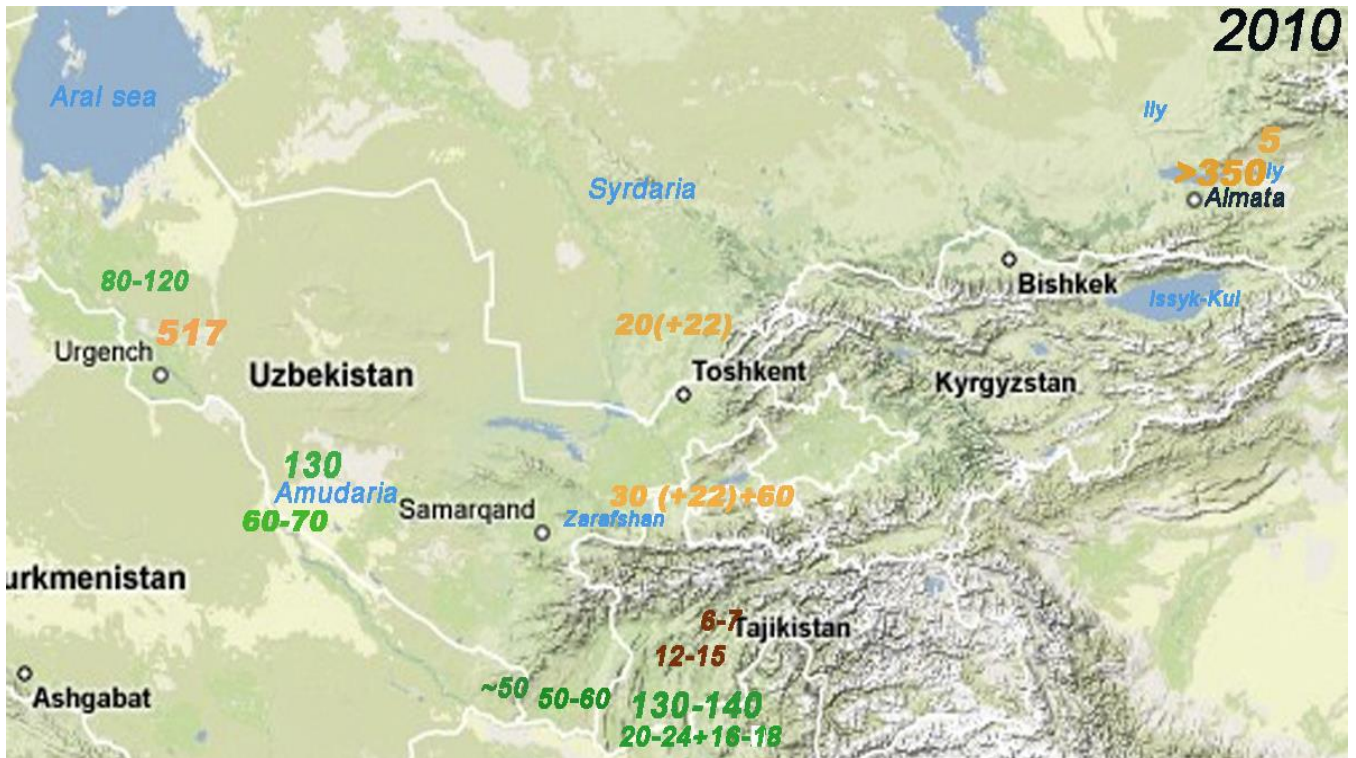
Map 3. Bukhara Deer distribution and numbers in various sites in 2004



Map 4. Bukhara Deer distribution and numbers in various sites in 2008



Map 5. Bukhara Deer distribution and numbers in various sites in 2010



Map 6. Bukhara Deer distribution and numbers in various sites in 2019

