Cervus elaphus bactrianus - Bukhara Deer

Deer (Artiodactyla Cervidae Cervinae)

Jump to page sections:

- Taxonomic Status
- Experts and Scientific Referees
- Species Information
- Maps
- Conservation Information
- Project Information
- Communication, education and information: available materials
- Recommendations, Remarks and Advice
- Project Proposals
- Photos And Other Pictures To Add
- Sources

Taxonomic Status

Scientific name

Cervus elaphus bactrianus

Common name

Bukhara (red) Deer, Bactrian deer, Bokharan deer and Hangul *(local version)*,

Synonyms

Comments on the subspecies

Scientists are still debating the phylogeny of *Cervus elaphus*. Nowak (1999) lists 7 subgenera and 10 species in the genus *Cervus* and Ludt et al. (2004) mention at least 22 known subspecies which occur in the Holarctic. However, some of these subspecies have been recently contested by genetic studies. Ludt et al. (2004) suggested in a study using mitochondrial DNA that Western Red Deer and Eastern Red Deer comprise individual species. Ludt et al. (2004) further subdivided the Western Red Deer into four subgroups: Western-Europe, Balkan, Middle-East and Africa (Ludt et al. 2004).

Comparative analysis of behavior and acoustic communication of bukhara deer (Pereladova, 1985 - 2009) allowed to point out, that according to behavioral characteristics bukhara deer differs seriously from other red deer subspecies. It is closest to the group of Indian and Chinese deer and even to the sika deer *(Cervus nippon)*. This is completely in accord with the latest genetic studies (Ludt e.a.., 2004) which states that there is "a very high probability for the existence of two different species of red deer with three subspecies in Asia and America (Eastern Red Deer) and four subspecies in Eurasia (Western Red Deer) and additional one or two primordial subspecies in Central Asia (Tarim group*: C.e.*

yarkandensis, C.e. bactrianus). The origin of the genus *Cervus* seems to be in Central Asia near today's Hindu Kush". It is quite probable that Kashmir stag – hangul – C.e.hangul – also belongs to this group, but it had not been included in the investigation. It is a group, which differs both from eastern and western deer. The subspecies *C. e. bactrianus* is considered part of a major systematic group described as relatively primitive and seriously endangered (Nowak 1999). This group appears to have given rise to both the red deer to the west and the wapiti to the north and east (Nikolskii, 1984, Pereladova, 2004; Nowak 1999).

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Species Information

Physical characteristics

Cervus elaphus bactrianus, the Bukhara deer, is a relatively small deer. The skull length is only about 390 mm and height at shoulder is 120 cm (Geist 1998). Its 5-pronged velvet coated antlers, considered primitive relative to related subspecies within *Cervus elaphus*, weigh only between 3.4 and 5.5 kg (measured from cast antlers) (Geist 1998).

The subspecies is sexually dimorphic – meaning that males and females differ in their external appearance. In general, *Cervus elaphus bactrianus* has a white rump patch, a short yellowish-brown tail that is lighter in color along its sides, and dark dorsal body hair (Geist 1998). Males are usually a uniform gray in warmer seasons but in winter some individuals can develop a dark neck, face, chest, belly and legs with a sandy gray body (Geist 1998, MacDonald 2006). The under portion of the coat is usually paler (Nowak 1999, MacDonald 2006). Males also possess a short neck mane (Geist 1998). Females possess no neck mane and are uniformly colored – generally lighter than the males – but have reddish hair on top of their heads and the dorsal portion of the neck (Geist 1999). Females also have a dark narrow strip down the front of their legs and whitish lips and chin (Geist 1998). Young are spotted although adults can have light spots in their coats during the summer months (Geist 1998, MacDonald 2006). Like other Artiodactyla, the first digit is absent from each foot, the third and fourth digits are well developed and bear the weight of the animal, and the second and fifth digits are small.

When Bukhara deer are introduced to unusual mountain habitats of the same arid zone (Ramit, Tajikistan), or regularly artificially fed in wildlife management areas (Karatchingil, Kazxakhstan) morphological characteristics of the subspecies seriously change (higher weight up to 30-40% – true both for the body-weight and for antlers; stronger developed front legs' girdle – Golub, 1986, Pavlov, Baidavletov, 1986/Pereladova 1990). After secondary translocation (from Ramit and Karatchingil to natural habitats) deer "return" to their usual morphological parameters.

Habitat, behaviour, food and reproduction

Habitats

Bactrian deer are partial to riparian forests called tugais in arid regions which include stands of *Tamarix, Elaeagnus, Poplar, Hippophae,* communities of *Phragmites* and *Erianthus* (Daviesson and Fet 2001). These 0.5-1 kilometer wide areas of woody and shrubby thickets are found along desert rivers (Bannikov 1978). In winter and early spring, deer may move into desert and semi-desert habitats to feed on shrubs (e.g.*Haloxylon sp.*) (Bannikov 1978, Geist 1998). Compared to others of the same species, Bactrian deer live in warmer and more arid environments. For instance, precipitation in Bactrian deer habitat is usually lower than 200 mm per year and air temperatures in the summer often exceeds 45°C (113°F) (Bannikov 1978). Because *Cervus elaphus bactrianus* have such narrow habitat preferences, there is little opportunity for individuals to disperse to other areas when their habitat is threatened (Geist 1998).

When introduced to unusual mountain habitats of the same arid zone (Ramit, Karatag, Sarykhosor – Tajikistan) they easily get used to mountain valley habitats (willows, wild fruit forests), although 2-3 generation adaptation process includes high level of traumatism (e.g. broken legs as a result of quick movement on the slopes) and changes of morphology (see above). In winter only mails manage to survive in the conditions of snow cover – while females and subadults concentrate in the lower parts of the valleys and need additional feeding.

Biology:

Bukhara deer is very conservative in the use of territory. They form small discrete groups with the sexes usually remaining separate for most of the year – typically males stay single, females with newborns/subadults, rather often – 2-3 females with posterity together. Herd size observed outside of the rut is usually between 4-7 individuals. In September males start to visit sites where home-ranges of a number of female groups are bordering or even overlapping, and form a lek. Bukhara deer is the only true deer subspecies for which a true lek is shown (Pereladova, 1994, 1998, 1999, etc.). Normally rutting period starts end of August with the peak of rut on mid September. Second half of September males join the females and regularly leave the lek for the daytime following females to their home ranges. During this period lek aggregations including a number of males with their female groups (typically 1-3 for Bukhara deer) are regularly seen in the daytime and confused to be just a mixed herds or large harems of other subspecies. Differently to other deer Bukhara deer stags are less aggressive even during the rutting period (towards subadults first of all), continue grazing in the daytime during all reproductive period. Usually the rutting season ends by the end of September- beginning of October. All varieties of this dynamics are connected with various abnormalities of the population density and structure (Pereladova 1998, 2009, etc).

The ability to outperform other males depends on body and antler size, fighting prowess, and roaring ability. Nevertheless, usually various modifications of rutting calls allows to avoid direct battles. Typically rather young stags of equal strength fight physically (often in presence of a mature stag with his harem group, and mature stags prevent serious fighting by special types of roaring.) and this fights are more like tournament. Males have a unique rutting call, which differs both from the low density noisy calls in series (up to 12-15 short signals in each) of western deer and from single long tonal

rutting calls of eastern and American deer. Bukhara deer rutting calls are either single or organized in short series (3-5) and each signal includes both low-frequency noisy component and high-frequency tonal component, independently modulated. Different modifications of the rutting calls are used in various situations. (Nikolskii, 1984, Pereladova, 1980, 1990, 1994, etc.). Besides that bukhara deer (both males and females) frequently use an alarm-call - single barks, organized in series.
After the rutting period males separate from females and groups (or single animals) return to their home ranges.
Bactrian deer reach maturity between 1.5 and 2.5 years of age (IUCN 2008) and a female is likely to produce several young at a rate of one per year through her lifespan (Bannikov 1978, MacDonald 2006, IUCN 2008). Calves are usually born around late spring. Males leave the mother at 2-3 years, but maximum maturity is attained at 4-7 years .
Bannikov (1978) indicated that it was unusual for Bactrian deer to migrate, especially in good habitat conditions. Depending on geographical location, deer were shown to move either several hundreds of meters or only 2-3 kilometers while searching for food during a twenty-four period (Bannikov 1978). However, in the 19th century, a seasonal migration of a Bactrian deer population was recorded. In the winter, the recorded population left the tugai forests of the Syr-darya River, which flows through southern Kazakhstan, eastern Uzbekistan, and northwestern Tajikistan, to reside in the neighboring *Haloxylon* deserts, returning the following summer. In addition, non-periodical migrations of the deer were observed during major spring and summer river floods and fires such as those caused by reed burnings (Bannikov1978). Besides that, in case of high population density and high number of young stags, their migrations are provoked by adult stags (pushing younger ones away from the leck – mid September) and that is the major way of the initial expanding of the area inhabited by the deer. Therefore, while Bactrian deer populations demonstrate a tendency to remain within defined areas, they are able to migrate outside these localized regions in search of more food or better habitat. Overall, 30 to 50% of all populations have been shown to migrate every year and cross national borders (CMS 2004).

Although in woodlands, *Bukhara deer* diet includes grasses, sedges and shrubs, tree shoots to a minor extent. Like all species in the family Cervidae, Bactrian deer have a four-chambered, ruminant stomach and lack a gall bladder . It is regular, that BD diet is very limited most of the year (e.g. when inhabiting reeds brushes). Differently from other red deer subspecies, which use branches up to 15 mm thick, BD eat only branches up to 5 mm (Sablina, 1970).

Estimated Generation Length: In the wild, few individuals of *Cervus elaphus* survive more than about 12-15 years, but a captive British female red deer has lived for more than 27 years (Bannikov1978, Nowak 1999).

Predation

Historically the major predator for the Bukhara deer was turanian (Caspian) tiger – extinct from nature since 1958-1962. Besides that wolf's press on the deer population is important. Jackal (and fox) can sometimes kill a newborn deer – just some hours after the birth, but usually the baby is successfully protected by the mother, and jackals can only sometimes use rests of the wolf's prey.

Historical distribution

Cervus elaphus bactrianus is a subspecies of red deer occurring in Central Asia – in river valleys of Turkmenistan, Uzbekistan, Kazakhstan, Tajikistan and Afghanistan. Historically it inhabited all river vallies of Amudaria and Syrdaria, as well as Murgab and Tedjen to the west (Turkmenistan), Zaravshan, various minor rivers – and Ily to the East (Map 1). (Geptner, 1961, Bannikov 1978).

Current distribution

In the 1960s many populations went extinct including those found in the river valleys of Syr Darya, Tedjen, Murgab, and Illi, and at the lower reaches of the Amu Darya (Bannikov 1978). Some populations were partially restored in the 1970s through reintroduction programs (Bannikov 1978) and was introduced in some new sites (see "Conservation" chapter) and resulted in total number around 900 deer total in 13-15 independent populations. (Map of species distribution in 1989). By the end of 1999 total number of Bukhara deer dropped dramatically to less then 350 animals total in the Central Asian countries of the FSU, no data on the species numbers in Afghanistan). Since 2000 the numbers are increasing in all sites (see "Conservation" chapter), and according to the census 2009 there were 1450 deer in wild populations and reintroduction is on-going in three sites (Syrdaria, Zerafshan and Ily).

3.3 Afghanistan Distribution: The Syr Darya and Amu Darya river basins line the border between Afghanistan and Uzbekistan and Afghanistan and Tajikistan. Bactrian deer populations remaining in Northern Afghanistan most likely exist in these borderlands (Figure 2) (Bannikov1978). Habibi (2003) suggested that the last two "strongholds" of Bactrian deer in Afghanistan included wetlands of Amu Darya near Imam Sahib in Kunduz Province and the river islands of Darqad in Takhar (along the Tajikistan border). Bactrian deer were introduced to Ajar Valley but were hunted to extinction there throughout the years of conflict (Habibi 2003).

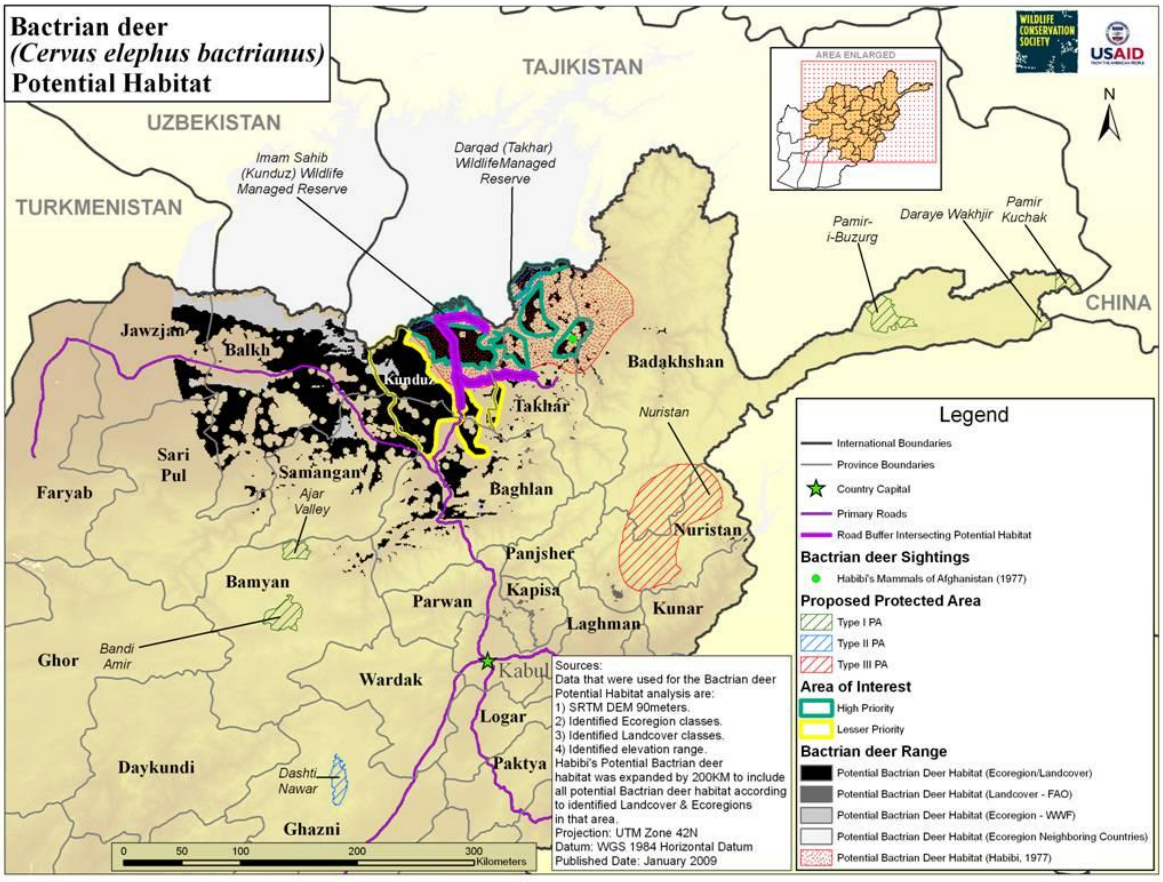

Figure 3. Bactrian deer potential habitat based on GIS analysis by WCS Afghanistan, 2009

Population size and trends

	Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
UZB	Badai-Tuagai NR	~100	120	140	150	160	220	250	265	316	346	374
	Kyzylkumskii NR	76	40	75	80	95	120	80	110	120	120	130
	Other territories	~50	~50	~50	~50	~60	~90	~90	~90	~100	~100	~100
	Zarafshan - reintroduction	9	10	14	18	20	23	26	32	33	39	46
	Subtotal	***~190***	***180***	***240***	***330***	***385***	***450***	***480***	***490***	***560***	***600***	***700***
KAZ	Karatchingil	80	100	150	~200	~250	~250	280	300	>300	>300	320-350
	Pens of Turkestan (Syrdaria)	0	0	4	6	8	10	12	15	19	22	34
	Subtotal	***80***	***100***	***150***	***~200***	***~250***	***250***	***280***	***300***	***280***	***350***	***370***
TURK	Middle reaches of Amudaria (7 sites)	30	35	35	45	50	60	70	80	94	106	100
	Djazguzer (Amudaria upper reaches)	~20	~25	~35	45	~50	~50	~50	~50	~50	~50	~50
	Subtotal	***50***	***60***	***70***	***90***	***100***	***110***	***120***	***130***	***140***	***150***	***150***
TAJ	Tigrovaja balka					80	>50	>50	>50	>80	>140	>150
	Zarafshan (upper reaches)					25		35	35	40	60	60-65
	Subtotal	***?***	***?***	***?***	***60***	***~100***	***?***	***~100***	***~100***	***120***	***200***	***210***
BD in the Region TOTAL		**~350**	**400**	**500**	**650**	**800**	**850**	**>900**	**1000**	**1100**	**1300**	**1430**

Captive populations

There are some Bukhara deer in the zoos and in Askania-Nova zapovednik (Ukraine), but as we have checked in many cases those are hybrids with other red deer subspecies – and it is difficult to be sure that captive-bred zoo animals are really Bukhara deer. Now there are pen groups of Bukhara deer in Badai-Tugai (30 animals) and Zaravshanskii (20 animals) zapovedniks in Uzbekistan and in the pens of Turkestan (20 animals) Syrdaria, Kazakhstan. The last two pen groups (Zarafshan and Turkestan) are developed in the frame of WWF project for reintroduction in Zarafshan and Syrdaria river valleys accordingly; 2-3 releases already took place, additional planned. Badai-tugai group was established during deer reintroduction in Badasi-tugai (Lim, Marmazinskaja, 2007). Now wild population in the site exceeds 300 animals, and deer from pens can be used for additional reintroduction projects in the suitable riparian forests in the Amudaria delta and former bottom of the Aral sea.

Threats

The biggest threats to Bactrian deer are poaching, illegal trade, and habitat loss and degradation (IUCN 2008). Along Amudaria (Turkmenistan, Uzbekistan) only 10% of riparian forests still remain, the rest – replaced by fields. In other river valleys the situation with riparian forests (major habitats) is better – but deer dissapered from there since 1962 – and the only way of restoration is reintroduction.
In Mongolia and China, Bactrian deer parts are traded for use in traditional medicines **(???)** (especially the velvet antlers) (IUCN 2008). In Afghanistan, poaching for food as well as significant losses in habitat due to livestock grazing and reed burning has caused significant declines in the past few decades (IUCN 2008).

Intensive development of agriculture, tree and shrub felling on river banks, cattle grazing, and uncontrolled hunting led to the decline of Bactrian deer populations in the 1960s (Bannikov 1978, Nowak 1999). Strenuous conservation efforts, including designation of protected areas, allowed for a slight recovery (Bannikov 1978, Nowak 1999). However, Bactrian deer likely remained threatened, especially in Afghanistan where national laws have yet to be passed and lack of food and financial security may increase poaching in the borderlands (Johnson, personal communication).

Conservation Information

IUCN Red List

The Bactrian deer was classified as Vulnerable in 1994 (IUCN 1994). However, it is currently listed under *Cervus elaphus*, which is Least Concern.

EU habitat directive

CITES

EU Wildlife trade regulation EC Reg. 338/97

Bern convention –

Bonn convention

MOU/Action plan signed by Tajikistan, Kazakhstan, Uzbekistan, Turkmenistan in 2002

Conservation status

Red data books of all range states;

The population has declined from 900 in 1989 to 350 in 1999. According to the latest data – census in 2009 – the total number of Bukhara deer in Kazakhstan, Tajikistan, Turkmenistan and Uzbekistan is 1430**.Nevertheless the populations in Central Asian countries are recovering thanks to special measure~~,~~ the Bactrian deer should be classified as Endangered C1 as all separate populations are still small and sustainability is not ensured.

Socio-economic aspects

Conservation organisations and important websites

WWF Russia : http://www.wwf.ru

http://www.wwf.ru/about/where_we_work/asia/closed/bukhara_deer/eng/

http://www.wwf.ru/about/where_we_work/asia/closed/tiger_balka/eng/

http://www.wwf.ru/about/where_we_work/asia/tajik/eng/

http://www.wwf.ru/about/where_we_work/asia/kazakh/eng/

CMS : http://www.cms.int/

25-th anniversary of CMS : Presentation on Bukhara deer – result of conservation **http://www.groms.de/groms/work25/vortrag.html#pereladova**

Project Information

The bukhara deer (BD) -was seriously threatened already in 1960-th, first of all – because of habitat destruction. The history of the first phase of BD restoration included special protection in existing and specially established nature reserves, reintroduction and introduction in new sites

(such as mountains of Ramit in Tajikistan (Abdusaliamov, 1982, Sokov, 1976, Zainutdinov, 1986, Vologeninov , 1 973, Golub, 1986, Mambetjumaev, 1961, 1967, Sinelnikov, 1964; etc. – all in Russian - sited after Flint, Pereladova, Mirutenko, 1990). As a result, by 1989 there were about 900 BD totally in all groups, with potential for population growth up to 4000 – 5000 animals. After the break of the former Soviet Union only 350 BD rested in all populations throughout the area - as a result of poaching.

Since 1999 WWF carries out a project on BD restoration. The very first funding was provided by LHI (5 th. USD) in 1999, major funding is provided by WWF Netherlands (~ 50 th. a year for 4 countries) with some additional support from for Tajikistan (deer habitats restoration) from Minnesota zoo and Disney Fund. Since 2007 important funding for Tajikistan and Kazakhstan is provided by MFA/WWF Norway.

The activities include technical support to the nature reserves, still inhabited by BD, anti-poaching activities, reintroduction in suitable sites in the limits of historical area, ecological education/local communities involvement, etc. All restoration activities are accompanied by species monitoring. Measures on population sustainable management are based on in-depth analysis of the ecology, social behavior of BD. As a result of the scientifically-based approach to the species restoration important successful results in the subspecies restoration achieved. Total Bukhara deer number increased from 350 in 1999 to 1450 in 2009, successful reintroduction on-going in three sites; possibilities for reintroduction in additional sites investigated, activities in one additional site started.

Communication, education and information: available materials

Variable information materials available – in Russian and national languages of the countries of the species area (except Afghanistan)

Recommendations, remarks and advice

Project Proposals

Photos And Other Pictures To Add

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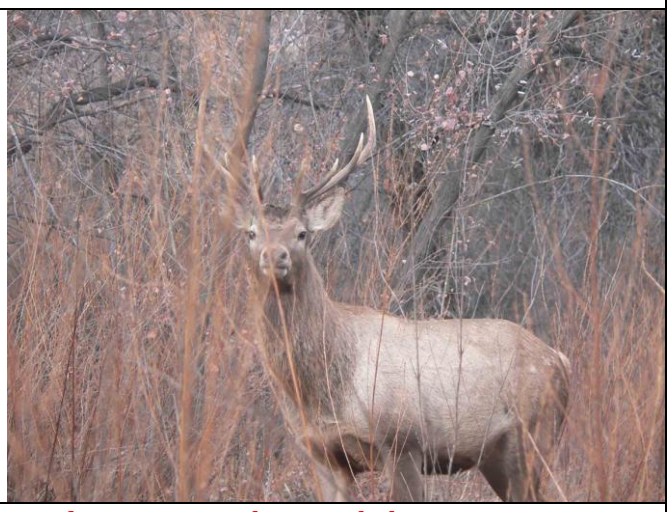
Ryspek Baidavletov, Kazakhstan



Natalia Marmazinskaja, Uzbekistan

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