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Capra falconeri



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Taxonomy [\[top\]](#)

Kingdom	Phylum	Class	Order	Family
ANIMALIA	CHORDATA	MAMMALIA	CETARTIA	DACTYLABOVIDAE

Scientific Name: *Capra falconeri*

Species Authority: (Wagner, 1839)

Common Name(s):
English–Markhor

Synonym(s): *Aegoceros falconeri* Wagner, 1839

Taxonomic Notes:

Three subspecies are recognized (Grubb 2005): *C. f. falconeri* (Wagner, 1839), *C. f. heptneri* (Zalkin, 1945), and *C. f. megaceros* (Hutton, 1842). Other sources have recognized *C. f. jerdoni* (Hume, 1875) and *C. f. cashmiriensis* (Lydekker, 1898). Schaller and Khan (1975) considered the former Astor Markhor (*C. f. falconeri*) and Kashmir Markhor (*C. f. cashmiriensis*) to be one subspecies, the Flare-horned Markhor (*C. f. falconeri*) and Kabul Markhor (*C. f. megaceros*) and Sulaiman Markhor (*C. f. jerdoni*) to be one subspecies, the Straight-horned Markhor (*C. f. megaceros*).

Assessment Information [\[top\]](#)

Red List Category & Criteria: Near Threatened [ver 3.1](#)

Year Published: 2015

Date Assessed: 2014-09-19

Assessor(s): Michel, S. & Rosen Michel, T.

Reviewer(s): Festa-Bianchet, M., Harris, R. & Zahler, P.

Contributor(s): Ali Khan, A., Arshad, M., Bhatnagar, Y.V., Frisina, M., Hussain, S., Karimov, K., Lukarevskiy, V., Mohammad, G., Ostrowski, S., Uz Zaman, I., Valdez, R., Xoliqov, T. & Yasir Abbas, S.

Justification:

This species is assessed as Near Threatened: it nearly qualifies as Vulnerable under criterion C2a(i) as there are less than 10,000 mature individuals (estimated 5,808, based on our analysis of data from 2011-2013) and each subpopulation, except one, has less than 1,000 mature individuals. The largest subpopulation had an estimated 1,697 mature individuals in 2011. There is no observed, estimated, projected or inferred continuing decline of the total population. However, stable and increasing subpopulations are restricted to areas with sustainable hunting management and protected areas. Were these conservation activities to cease in the future, poaching would likely increase, possibly changing positive trajectories in these areas downward, and the species would then qualify as Vulnerable.

The previous (2008) assessment of Endangered appears erroneous. The data available would have qualified the taxon for the category Vulnerable based on criterion C with <10,000 mature individuals, because the most recent estimates cited by Valdez (2008) ranged from 5,080 to 5,630 (mean 5,355) individuals, of which 60% or 3,213 would have been mature animals. Further, there had been an inferred

continuous decline (C1), and in the largest subpopulation in the Torghar Hills there were an estimated 1,600 individuals, of which 960 (60%) would be assumed to be mature, just meeting the threshold of criterion C2a(i) for the category Vulnerable.

The reason for the change from category Vulnerable (the corrected 2008 assessment) to Near Threatened is Genuine (recent, since assessments 1994, 1996 and 2008). Available data show that the earlier population decline had ceased for more than five years due to effective conservation measures. This has led to the stabilization of key subpopulations and increase in parts of the species range. Since 2002, the largest subpopulation has been estimated at >1,000 mature individuals for a number of years. Thus, criteria C1 and C2a(i) for Vulnerable have not been met for five or more years.



For further information about this species, see [3787_Capra_falconeri.pdf](#).
A PDF viewer such as [Adobe Reader](#) is required.

History: 2008 – Endangered
1996 – Endangered

Geographic Range [\[top\]](#)

This species is found in northeastern Afghanistan, northern India (southwest Jammu and Kashmir), northern and central Pakistan, southern Tajikistan, southwestern Turkmenistan, and southern Uzbekistan (Grubb 2005).

Capra falconeri falconeri

Afghanistan: historically occurred in the eastern portion of the country, in the high mountainous, monsoon forests of Laghman (headwaters of Alingar and Alishang Rivers); Kunar and Nuristan (Habibi 1977, Petocz 1972, Petocz and Larsson 1977) and is still extant at least in south central Nuristan (WCS 2008, Stevens *et al.* 2011).

India: restricted to part of the Pir Panjal range in southwestern Jammu and Kashmir (Ranjitsinh *et al.* 2005, Bhatnagar *et al.* 2007, Bhatnagar *et al.* 2009). Populations are scattered throughout this range, starting from just east of the Banihal pass (50 km from the Chenab River) on the Jammu-Srinagar highway westward to the disputed border with Pakistan. Bhatnagar *et al.* 2009 observed Markhor only in Kajinag and Hirpura, and confirmed evidence of their occurrence in Boniyar and Poonch. In the areas of Shamsabari and Banihal Pass the taxon is likely extinct.

Range Description:

Pakistan: a detailed study on the past and present distribution of “Kashmir” Markhor by Arshad (2011) showed that the area of occupancy and the number of locations have declined greatly (approx. 70%) during the 20th century. However, historic ranges larger than present ranges are partly a result of too much generalization in the older distribution maps, which include large sections of unsuitable habitat. It is not clear to what extent exchange takes place between the often small groups of Markhor inhabiting different watersheds. Flare-horned Markhor are mainly confined to the Indus and its tributaries, as well as to the valleys of the Kunar (Chitral) river and its tributaries. According to Schaller and Khan (1975), along the Indus River, Markhor inhabited both banks from Jalkot (District Kohistan) upstream to near the Tungas village (District Baltistan), with Gakuch being its western limit on the Gilgit River, Chalt and (Haraspo) Sikandarabad on the Hunza River, and the Parishing Valley on the Astor River. Currently, Markhor are known from various locations in the Diamer, Astor, Gilgit and Baltistan Districts. Markhor are found along the Nagar Hunza River from Sikandarabad downstream, in Naltar Valley, along the Gilgit River downstream from Singul

and along the Indus River downstream from Basho to the provincial border with Khyber-Pakhtunkhwa (WCS, Mayo Khan pers. comm. 2014). Markhor are known to be present in the Juglot Ghooro, Rahimabad and Haramosh valleys in Central Karakoram National Park (Athar A. Khan and Syed Yasir Abbas, Ecologist, Central Karakoram National Park, pers. comm. 2014). The population in Haramosh was considered extinct by Arshad (2011), but since winter 2011 Markhor have been observed there (Athar A. Khan and Syed Yasir Abbas, pers. comm. 2014), possibly indicating natural recolonization. The distribution range in Gilgit-Baltistan has been updated based on information from various sources (WCS, Mayo Khan pers. comm. 2014). In Khyber-Pakhtunkhwa, Flare-horned Markhor were found around Chitral and the border areas with Afghanistan where it inhabited valleys along the Kunar River (Chitral District), from Arandu on the west bank and Drosch on the east bank, up to Shoghor along the Lutkho River, and as far as Barenis along the Mastuj River (Schaller and Khan 1975). The distribution range in Chitral has been updated based on Arshad (2011), and includes side valleys of the Indus River upstream from Dubair, the Shishi River Valley as well as the Chitral River Valley and its tributaries upstream from Chitral up to Kaghozi Gol (Mastuj River Valley) and Shogore (Lutkho River Valley).

Capra falconeri heptneri

This subspecies previously occupied most of the mountains lying along the banks of the Upper Amu Darya and the Pyanj Rivers from Turkmenistan to Tajikistan. Currently, it is found in only two or three scattered populations and its distribution has been greatly reduced (Weinberg *et al.* 1997). The subspecies was confirmed to occur as well in Afghanistan on the bank of the Pyanj River (Moheb and Mostafawi 2011, 2012).

Afghanistan: almost nothing was known of this subspecies or its distribution before 1979 (Habibi 1977). Reconnaissance surveys and interviews with villagers have shown that, across from the two strongholds of Markhor in Tajikistan, this subspecies exists but in very low numbers in the Darwaz Region (Kof Ab district, ~ 38°02' N, 70°23' E) of Badakhshan Province, and in Shahr-e Buzurg District and neighboring Chah Ab District of Takhar Province (~ 37°31' N, 70°02' E). The Markhor seem to cross the Pyanj River (which forms the border between Afghanistan and Tajikistan; Moheb and Mostafawi 2011, 2012).

Tajikistan: limited to the region along the Pyanj River east of Kulyab, southern Hazratishoh range (~ 70°05' E and 37°54' N), including the Kushvariston massif (~ 70°03' E, 37°35' N) and the Pasi Parvor mountains (~ 70°16' E, 37°44' N), and the eastern slope of the southwestern edge of the Darvaz range (~ 70°21' E, 38°05' N, Shuroabad district of Khatlon Region and Darvaz district of GBAO Region). Formerly markhor were reported from the Babatag Mountains (~ 68°03' E, 37°46' N) at the border with Uzbekistan (Ishunin 1972) and from the Sanglak and Sarsarak Ranges (southern parts of the Vakhsh Range, ~ 69°7' E, 38°13' N) (Abdusalyamov 1988). No recent reliable information suggests that Markhor still exist in the Babatag (Michel *et al.* 2014). The presence of Markhor in the Sarsarak Range was confirmed in 2014, but the species has been extirpated from the Sanglak Mountains (Khalil Karimov, Panthera, pers. comm. 2014).

Uzbekistan: found in the Kugitang Range (~ 66°36' E, 37°48' N) at the border with Turkmenistan. Its occurrence was reported in the middle of the 20th century from the Babatag Range (~ 68°03' E, 37°46' N) at the border with Tajikistan (Bogdanov 1992).

Turkmenistan: restricted to the western slope of the Kugitang Range (~ 66°31' E, 37°49' N), bordering Uzbekistan (~ 66°40' E, 37°30' N; Weinberg *et al.* 1997a).

Capra falconeri megaceros

In Afghanistan, at least until 1978, this subspecies survived in the Kabul Gorge (Kabul Province) and the Kohe Safi area of Parwan Province, and possibly in some isolated pockets

of Paktia Province. Intensive hunting pressure had forced it into the most inaccessible regions of its once wider range (Petocz *et al.* 1977, Valdez, 2008). No recent information is available on whether or not the subspecies is still extant in Afghanistan.

In Pakistan, the most comprehensive study of the distribution and status of the Straight-horned Markhor was published by Schaller and Khan (1975). The study showed a huge past range for this subspecies, but the actual range in Pakistan at that time consisted only of small isolated areas in Baluchistan Province, a small area in the former Northwest Frontier Province (NWFP), and one unconfirmed occurrence in Dera Ghazi Khan District (Punjab Province). Virk (1991) summarized the information for Baluchistan Province, and confirmed the subspecies' presence in the area of the Koh-i-Sulaiman (Zhob District) and the Takatu hills (Quetta District), both according to Ahmad (1989). The presence of Straight-horned Markhor in the Torghar hills of the Toba Kakar range (Zhob District) has been repeatedly confirmed and it is possible that currently this area holds the only population consisting of more than 100 individuals of this subspecies (Tareen 1990, Frisina and Tareen 2009, Arshad and Khan 2009). Qadir Shah *et al.* (2010) and Mazhar Liaqat (2013) confirmed the presence of straight-horned markhor in the Ziarat Mountains in Ziarat District of Baluchistan Province. The NWFP Forest Department (NWFP 1987, 1992) considered that the areas of Mardan and Sheikh Buddin were still inhabited by the subspecies. There is no recent information about the Safed Koh range (Kurram and Khyber Districts) where, according to Schaller and Khan (1975) probably at least 100 animals lived on the Pakistan side of the border with Afghanistan in the early 1970s.

Countries: Native:
Afghanistan; India (Jammu-Kashmir); Pakistan; Tajikistan; Turkmenistan; Uzbekistan

Range Map: [Click here to open the map viewer and explore range.](#)

Population [\[top\]](#)

The criteria for Red List Categories refer to mature individuals, but most available population data present total numbers. Here we referred to these total numbers; and for the assessment we assumed that 60% of each population estimate were mature individuals, defined as “the number of individuals known, estimated or inferred to be capable of reproduction” (IUCN Standards and Petitions Subcommittee 2014). In the case of Markhor, this definition excludes kids and yearlings.

Population: The most recent data for most of the species' range are from different time periods (2008–2014) and of variable quality, including information based on observations, estimates and educated guesses. Data from 2011–2013 are available for most areas, suggesting a total of about 8,800 Markhor. This number does not include some areas for which no data are available for that period. Based on older data and trends we assumed that in total approximately 900 Markhor existed in those areas, for a global population of about 9,700. We therefore assess the global population to be more than 5,800 mature individuals.

Capra falconeri falconeri

In Afghanistan, during a survey in April 1972, 37 Markhor were counted in the upper Alingar Valley, and numerous signs of presence and reports by local hunters were documented there and in the upper Alishang Valley, suggesting a viable population (Petocz 1972). In south central Nuristan Petocz and Larsson (1977) recorded 350 Markhor, but considered this number a small proportion of the local population. The observed sex-age structure indicated high reproduction and possibly a fairly stable population size or moderate decline despite hunting pressure. In contrast, in eastern Nuristan Petocz *et al.* (1977) found a dramatic decline caused by hunting. Camera surveys, hunter interviews, and participatory distribution

mapping conducted by the Wildlife Conservation Society (WCS) in south central Nuristan during 2006-2007 and 2008 (WCS 2008, Stevens *et al.* 2011) suggested that the species was still present in the area surveyed by Petocz and Larsson (1977) and that the occupied range area was still largely the same. Although a 370 km transect survey by the WCS team recorded only three individuals, information obtained from local hunters and the importance of the species as main object of hunting indicated a population at least in the range of up to a few hundred animals.

In India, a survey of the species October 2004 to April 2005 in the Hirpura and Kajinag areas of the Pir Panjal Mountains in Jammu and Kashmir, recorded 35 Markhor groups, comprising 155 individuals (Ranjitsinh *et al.* 2005). This count, as well as interviews with key local informants, indicated that 350–375 Markhor may have existed in the surveyed area of Jammu and Kashmir. This is slightly higher than earlier numbers of 200–300 (Schaller 1977, Fox and Johnsingh 1997), probably because earlier reports were incomplete guesses based on information from only parts of the Kashmir Valley. The taxon's range had contracted from about 300 km² in the late 1940s to about 120 km² in 2004–2005. (Bhatnagar *et al.* 2009)

For Pakistan, population numbers are available for various time periods and for different locations. Areas were surveyed during different seasons. The numbers we present are based on differing methods (counts, estimates, guesses), and names, locations and borders of specific sites are not always clearly defined. Most recent numbers are available for 2011 and 2012, suggesting a total number of about 4,500 Flare-horned Markhor. More than 1,500 occurred in Gilgit-Baltistan (WCS 2012), 2,959 in Khyber-Pakhtunkhwa (Iftikhar Uz Zaman pers. comm. 2014); and Arshad (2011) believed that in Azad Jammu and Kashmir approximately 50 Markhor existed. If these figures are correct, they indicate a substantial increase from the previous Red List assessment (Valdez 2008), when less than 2,500 to 3,000 Flare-horned Markhor were assumed to survive in Pakistan. Approximately 21 years before the current assessment (or about three generations), there were thought to be in total about 2,075-2,575 Flare-horned Markhor, including 1,075 in Khyber-Pakhtunkhwa (NWFP 1992) and 1,000-1,500 in Gilgit-Baltistan (NA Forest Department unpubl. information 1993, reported in Valdez 2008). Thus numbers in Gilgit-Baltistan may have remained stable or increased, while the population in Khyber-Pakhtunkhwa appears to have increased substantially.

Schaller and Khan (1975) assumed a total of at least 5,250 Flare-horned Markhor living in Pakistan and in India. Petocz (1972) and Petocz and Larsson (1977) counted 387 animals in Afghanistan. The total population number of the subspecies at this time was thus about 5,650 Markhor (about 3,380 mature individuals). Available data suggest that during the period 1985-1993, the total number for the subspecies might have been around 2,950 (1,770 mature individuals). Arshad (2011) assessed the total population number for “Kashmir” Markhor alone at 1,800–2,000 individuals. An educated guess, combining data from different areas, suggests that as of 2012, the total population of *C. f. falconeri* was close to 5,000 (i.e., about 3,000 mature individuals). Hence the total population of this subspecies apparently decreased from the early 1970s to the early 1990s, but since then it appears to have recovered.

Data for specific locations in Pakistan show varying trends of population numbers:

1. In 1970, the Chitral Gol, a valley of 77.5 km² in the Chitral District of Khyber-Pakhtunkhwa Province (formerly NWFP), and at that time the private hunting reserve of the Mehtar of Chitral, was estimated to harbour 100 to 125 animals (Schaller and Mirza 1971). In 1984, this area was declared a National Park, and by 1985-86, it contained 160 (recorded) to 300 (estimated) animals. In addition, the proportion of males > 4.5 years in the population increased during the same period (Hess 1986). Within this time span, Aleem (1979) recorded a maximum of 520 animals in Chitral Gol in 1979. The increase was attributed to better protection from poaching and to other

improvement efforts in the Park (Malik 1985). However, according to Ahmad (unpubl. data, quoted in Valdez 2008), the population in Chitral Gol National Park was reduced to 195 Markhor in 1987. Estimates by Arshad (2011) showed an increase to 373 in 2003 and 590 in 2005/2006. Ali (2008) confirmed the positive trend leading to 612 Markhor recorded in 2006 with a computed annual growth rate of 7.7%. I. Uz Zaman (pers. comm. 2014) reported an increase of the estimated population in Chitral Gol National Park Wildlife Division (including Chitral Gol National Park and its buffer zone, Arshad pers. inf. 2014) from 1,146 in 2009 to 1,364 Markhor in 2012, a greater rate of growth than that suggested by a projection of the data presented by Ali (2008). The precision of these estimates cannot be assessed, as some earlier counts may have been biased low, and the area covered during different surveys might have changed and be thus not directly comparable. Nevertheless, these estimates suggest a substantial increase in the Chitral Gol National Park and adjacent areas.

2. For the Tushi Game Reserve (GR) in the Chitral District, Schaller and Khan (1975) estimated 125 animals, similar to the estimate in 1985-86 (anonymous 1986, Hess in press, quoted in Valdez 2008). In the Tushi Shasha Conservancy, Ali (2008) observed 137 Markhor in 1990 and 545 in 2006, from which he calculated an annual population growth of 7.9%. For the entire Chitral Wildlife Division (without Chitral Gol National Park Wildlife Division) I. Uz Zaman (pers. comm. 2014) reported an increase of the estimated population from 1,049 in 2009 to 1,456 Markhor in 2012.
3. The NWFP Forest Department (NWFP 1992) estimated 221 Markhor in Kohistan and 58 in Swat of Khyber-Pakhtunkhwa Province. According to I. Uz Zaman (pers. comm. 2014) numbers recorded in Kohistan from 2009 to 2012 varied between 128 and 233, whereas recorded numbers in Swat decreased from 110 in 2010 to 11 in 2012.
4. The population of Markhor in the Kargah Wildlife Sanctuary (Gilgit District of Gilgit-Baltistan Province) was estimated by Roberts (1969) as not less than 500 to 600 animals; by Schaller and Khan (1975) as 50; by Rasool (no date, probably 1976, quoted in Valdez 2008) as 109; by Hess (1986) as 50 to 75; and by Rasool (unpubl. data, quoted in Valdez 2008) in 1991 as 40-50. In 2012 this population had reportedly recovered to 300 animals (WCS 2012).

Capra falconeri heptneri

WCS staff surveyed parts of the potential range of *C. f. heptneri* in Northern Afghanistan in 2011. Due to security problems these surveys covered only small areas. The team observed four Markhor between Payan-e Moor and Aspakha Villages in the Kohe Ghaws area of Shahr-e Buzurg in Takhar Province. Local hunters believed that there were perhaps 20 Markhor left in this area. The interviews in Shahr-e Buzurg strongly supported the historical presence of Markhor in this district: 41 informants from northern and central Shahr-e Buzurg believed that Markhor were abundant in northern Shahr-e Buzurg during the 1970s. In the area between Dahan-e Ab Kof and Leiwgard Village in the Gandamargh Valley (Kuf Ab District in Darwaz, Badakhshan Province), the team observed six Markhor. Interviews with local hunters suggested that this area held approximately 80 Markhor (Moheb and Mostafawi 2011, 2012).

In the ex-Soviet republics, the total population was estimated to be about 1,000–1,200 animals in the 1970s (Zhironov 1977), generally decreasing in the 1990s to about 700 animals (Weinberg *et al.* 1997a). However, Weinberg *et al.* (1997b), based on reports from game wardens and local inhabitants, believed the local population in Kugitang Strict Nature Reserve in eastern Turkmenistan increased during the mid-1990s.

Between 1960 and 1970, Zhironov (1977) assumed that there were approximately 1,000 Markhor in Tajikistan, with the only viable population in the Kushvariston and Hazratishoh Mountains. In contrast, Sokov (1983, quoted in Baskin and Danell 2003) assumed that in 1967 only 500 remained in Tajikistan, decreasing to 400 by 1983. During the late 1980s in the

Hazratishoh Range and in Kushvariston (Tajikistan) there were around 350 Markhor (Sokov 1989). Survey data from 2008-2012 (Michel et al. 2014) indicated that the subpopulation in the Hazratishoh and Darvaz Ranges of Tajikistan was stable and likely increasing, with a total of 1,018 recorded in 2012. A survey in 2014 recorded 1,300 in these areas (Alidodov *et al.* 2014) In the Sarsarak Range a separate population was rediscovered in 2014, with eight Markhor counted and about 30–40 reported by local hunters (K. Karimov pers. comm. 2014).

During surveys on the western (Turkmenistan) slopes of the Kugitang Range in 1995 and 2000, Weinberg et al. (1997b) and Lukarveski (2002) recorded 227 and 303 Markhor respectively. No recent information from Turkmenistan is available on the population number and trend of this subpopulation. Given the stable or slightly increasing numbers at the eastern (Uzbekistan) slope of the Kugitang Range, we assume that in Turkmenistan currently there are about 250 Markhor.

In the early 1980s there were 400 Markhor in Uzbekistan according to the Red Data Book of Uzbekistan (1983), but in 1994 there were only 270-290 estimated in Uzbekistan, with only 86 counted in the Surkhan Strict Nature Reserve (western slope of Kugitang Range) in May 1993 (Chernogaev et al. 1995). Survey data by the administration of Surkhan Strict Nature Reserve suggested an increase since a low in 2003 (140-150 recorded, 160–180 guessed), reaching its maximum at 310–313 animals in 2013 (Xoliqov 2013).

An educated guess, combining data from different areas, suggests that the recent (2011-2013) total population of *C. f. heptneri* was about 1,680 Markhor (1,008 mature individuals).

Capra falconeri megaceros

In Afghanistan, few animals survived even in the late 1990s, perhaps 50-80 in the Kohe Safi region, with a few in other isolated pockets (Valdez 2008). No recent information is available on the population numbers of straight-horned Markhor in Afghanistan. The subspecies may be extirpated in the country, but potentially Markhor from Pakistan (e.g., Torghar hills) may cross into Afghanistan.

In Pakistan, population numbers for straight-horned Markhor are well documented for the Torghar Hills (Baluchistan). Roberts (1969) believed that the main concentration of the straight-horned Markhor was in the Toba Kakar and Torghar hills and numbers could have been less than 500. In 1984, Tareen estimated that fewer than 200 Markhor remained in the Torghar Hills (Mitchell 1989, quoted in USFWS 2012). The estimate by Frisina (pers. comm. 2014) of 1,684 for 1999 represents a substantial increase compared to Johnson (1997) who estimated there were 695 Sulaiman Markhor in the Torghar Hills in 1994. Rosser et al. (2005) summarized results from surveys that suggested Markhor in the Torghar Hills had increased to over 1,600 by the year 2000. Arshad and Khan (2009) presented an estimate of 3,158 Markhor in Torghar in 2008. M. Frisina (pers. comm. 2014) considered this estimate possibly biased, and based on a new, conservative analysis of these data, suggested revising this estimate to 1,729. The most recent population estimate of 2,829 in 2011 is from M. Frisina (pers. comm. 2014).

There is no recent estimate for straight-horned Markhor in other areas in Pakistan, but we assume there to be about 200 *C. f. megaceros* in other areas of Baluchistan and Khyber-Pakhtunkhwa. Schaller and Khan (1975) estimated 150 straight-horned Markhor in the Takatu hills in 1971, but later Ahmad (1989) reported that only 50 still existed in these hills, and only 100 in the area of Koh-i-Sulaiman. In the Ziarat Mountains in Balochistan, Qadir Shah *et al.* (2010) recorded nine and Mazhar Liaqat (2013) counted 32 Straight-horned Markhor. The NWFP Forest Department (NWFP 1992) gave a total of only 24 animals for the whole province: 12 for the Mardan area, and 12 for the Sheikh Buddin National Park.

Although an accurate estimate of the total number of this subspecies is not possible, it can be assumed that with the population in the Torghar Hills estimated at 2,829 in 2011 (M. Frisina pers. comm. 2014) the total number might be slightly above 3,000 animals. In the 1990s this total was assumed to be around 870 (Ahmad 1989, NWFP 1992, Johnson 1997 quoted in Frisina and Tareen 2009, Valdez 2008). Schaller and Khan (1975) estimated that more than 2,000 individuals remained throughout the entire range of straight-horned Markhor in Pakistan. Roberts (1969) estimated that the total population of the former subspecies *C. f. jerdoni*, restricted mainly to the Province of Baluchistan, may have exceeded 1,000 animals, but that it was severely threatened because it survived in discontinuous and isolated pockets. For this same area, Schaller and Khan (1975) estimated fewer than 1,000 animals. Thus, over the past 20 years, numbers have recovered substantially, but this is known only for one area, the Torghar Hills.

For further information about this species, see [3787_Capra_falconeri.pdf](#).

A PDF viewer such as [Adobe Reader](#) is required.

Population Trend:  Increasing

Habitat and Ecology [\[top\]](#)

Habitat and Ecology:

Capra falconeri is adapted to mountainous terrain with steep cliffs, between 600 and 3,600 m elevation. The species is typically found in areas with open woodlands, scrublands and light forests. In Pakistan and India these are made up primarily of Oaks (e.g. *Quercus ilex*), Pines (e.g. *Pinus gerardiana*), Junipers (e.g. *Juniperus macropoda*) and Deodar Cedar (*Cedrus deodora*) as well as Spruce (*Picea smithiana*) and Fir (*Abies spectabilis*, *A. pindrow*) in certain areas. In Tajikistan the vegetation in the lower parts consists of open woodland and shrub communities with Pistachio (*Pistacia vera*), Redbud (*Cercis griffithii*) and Almond (*Amygdalus bucharica*); with increasing elevation Juniper Trees (*Juniperus seravschanica*), (*J. semiglobosa*), mixed with shrubs of Maple (*Acer regelii*, *A. turkestanicum*), Rose (*Rosa kokanica*), Honeysuckle (*Lonicera nummulariifolia*) and *Cotoneaster spp.*. Markhor rarely use the high mountain zone above the tree line. Markhor are diurnal, but most active in the early morning and late afternoon. They alternate seasonally between grazing (summer) and browsing (winter), eating grasses and leaves. Females gestate for 135-170 days and give birth typically to 1-2 kids. The animals are sexually mature at 18-30 months, and live up to 12-13 years. Predators include Wolf (*Canis lupus*), Snow Leopard (*Panthera uncia*), Lynx (*Lynx lynx*) and on kids Golden Eagle (*Aquila chrysaetos*).

Systems: Terrestrial

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Use and Trade: See Use and Trade details under Threats.

Threats [\[top\]](#)

Capra falconeri falconeri

Major Threat(s):

Within Afghanistan, Markhor have traditionally been hunted in Nuristan and Laghman, and this may have intensified during the Afghan wars since 1979. According to surveys by WCS in Nuristan during 2006-2007 and 2008 (WCS 2008), Markhor continue to be the most important game for local hunters (despite a nominal nationwide ban on hunting). Petocz and Larsson (1977) wrote that rangelands and forests were likely capable of supporting a higher Markhor population than that observed. They assumed that impact of livestock grazing on habitat conditions was limited because the number of domestic animals was restricted by the area's capacity to produce and store winter fodder, as heavy snowfall prevents winter grazing. Recent

numbers of livestock are unknown for Nuristan, but recent increases associated with an expanding human population may create competition for forage (WCS 2008). According to a study using recent satellite imagery (Delattre and Rahmani 2007) no large-scale deforestation of the coniferous forests was observed in Markhor habitat in Afghanistan. However, the extent of deforestation for the last five years in a region affected by war and largely out of state control is unknown.

In India, all Markhor populations are small (usually < 50) and fragmented. The largest population, in Kaji Nag, may have potential for long-term survival if immediate conservation measures can be implemented. Key threats to the Markhor's range are insurgency-related effects, intensified local resource use, poaching, and large-scale development. Poaching by professional hunters may have been the primary cause of decimation of Markhor in the past, but communal hunting during winter was practised until recently. Armed conflicts may have increased poaching by both the military and militants, while poaching by local people may have declined due to confiscation of arms and restriction on human movements. Other pressures come from habitat encroachment by camps of Gujjars and the armed forces, excessive livestock grazing by local and nomadic Bakkarwal herders in parts of the range, and collection of timber and other forest products. Large scale development includes the proposed Mughal road connecting the state capital Srinagar with Rajouri, which passes through the Hirpura Wildlife Sanctuary, and limestone and gypsum mining around Limbar and Lacchipora Wildlife Sanctuaries. The Indian Government has fenced the entire Line of Control with multi-layered barbed wire. This may have caused further fragmentation of populations of Markhor (Bhatnagar *et al.* 2009).

In Pakistan, control of poaching in Chitral Gol National Park and in several community-based conservancies has been successful. There, the population is stable or increasing. However, many subpopulations of Flare-horned Markhor are still small (< 100) and the level of connectivity between them is unknown. The major threat outside established conservancies is poaching.

Capra falconeri heptneri

In Afghanistan, interviews suggested that within Markhor range overhunting is a considerable problem, with little capacity for enforcement of the national hunting ban (Moheb and Mostafawi 2011, 2012). As a result, Markhor appear to be under threat due to unsustainable hunting. (Moheb and Mostafawi 2011, 2012) Poaching in adjacent areas of Tajikistan is reported to threaten the source population of Markhor in Shahr-e Buzurg District (Moheb and Mostafawi 2011, Michel *et al.* 2014).

In Tajikistan, Markhor are poached for meat. There are published reports of skins and horns of about 100 poached Markhor being detected in a camp of Afghan poachers in Tajikistan (Michel 2010). According to Moheb and Mostafawi (2011), hunters in northern Shahr-e Buzurg in Afghanistan told numerous stories of groups of hunters going to Tajikistan to poach, and they showed horns and two skins said to originate from there. Because of remoteness, logistical hurdles and lack of security, the international border in this area remains difficult to control. Cross-border poaching affects the security situation for game wardens, researchers, tourists, and legal foreign hunters and thus jeopardizes the conservation of Markhor in the Dashtijum Strict Nature Reserve and adjacent areas. A recent report (Alidodov *et al.* 2014) suggests that in some areas poaching is mainly targeted at mature males (including illegal trophy hunting, Vaisman *et al.* 2014), and that there is a low proportion of adult males (4-5% of the total number, compared to above 20% in other areas). Habitat quality has deteriorated in some locations due to excessive and poorly regulated fuel wood cutting and intensive grazing.

In Turkmenistan, increasing grazing of goats and intense poaching threaten Markhor (Lukarevski 2002), whereas Weinberg *et al.* (1997b) reported that in 1995 grazing and illegal hunting seemed well controlled in Kugitang Strict Nature Reserve.

In Uzbekistan, Markhor are now largely restricted to the Surkhan State Strict Nature Reserve and its buffer zone. Despite their protected status, illegal cutting of trees and shrubs, livestock grazing, and poaching were reported (UNDP 2007). No specific information on the current status of these threats is available, but recent Markhor population data (Xoliqov 2013) suggest that the threats are controlled, at least to some extent.

Capra falconeri megaceros

Valdez (2008) reported that in Afghanistan excessive hunting by local people and forage competition with livestock were pushing Markhor to the periphery of its range. Such severe pressure was leading the population to a slow demise, and its status is unlikely to have improved since.

In Pakistan, the most important threat to subpopulations outside the Torghar Conservancy is illegal hunting. Other threats include competition with livestock, risk of disease transmission from livestock (Woodford *et al.* 2004), habitat degradation, and habitat loss (Sheikh and Molur 2004). According to Hess *et al.* (1997), significant habitat loss was caused by logging in the Sulaiman Range, which they considered the most important area of straight-horned Markhor's distribution. No recent data on the Markhor in the Sulaiman range are available and recent satellite images from 2011 and 2013 (Google Earth, accessed 2014) suggest that habitat conditions in the Sulaiman range are still largely suitable for Markhor.

Another threat for all Markhor subspecies may be posed by the spillover of contagious diseases from domestic goats and other livestock sharing Markhor habitat. Contagious Caprine Pleuropneumonia (CCPP), a contagious, lethal disease to caprids, perhaps overlooked for long time in the north of Pakistan, was recently confirmed to be present in domestic goats in Gilgit-Baltistan and south-western Tajikistan (Peyraud *et al.* 2014). *Mycoplasma capricolum* subsp. *capricolum*, an infectious bacterium hosted by domestic goats, killed at least 64 Markhor in fall 2010 in one area in Tajikistan (Ostrowski *et al.* 2011). In Kaigah, Kohistan, Pakistan, Nawaz (2002) reported an outbreak of enterotoxaemia in domestic goats that could spread to Markhor. In India diseases such as foot and mouth disease are reportedly common in livestock and can infect Markhor (Ranjitsinh *et al.* 2007).

Hybridization with domestic goats may be a potential threat for all subspecies as goats commonly graze in Markhor habitats. Hammer *et al.* (2008) found introgressive hybridization with domestic goat among 35.7% of Markhor from three zoos, and speculated that in some cases introgressed wild living ancestral *C. falconeri* herds may have been the source populations of captive Markhor.

Conservation Actions [\[top\]](#)

Conservation Actions:

All subspecies and populations of *Capra falconeri* were uplisted from Appendix II to Appendix I of CITES in 1992. The 10th meeting of the Conference of Parties to CITES in 1997 passed a resolution (Conf. 10.15) allowing for an annual export quota of six Markhor trophies from Pakistan's community-based hunting management areas to states parties to CITES. CITES increased the annual export quota to 12 in 2002, to further encourage community-based conservation (Resolution Conf. 10.15 (Rev. CoP 14)). The EU Scientific Review Group has expressed a positive opinion on the import of Markhor trophies from well-managed conservancies in Tajikistan (EU SRG 2014).

Within Afghanistan, the species was protected nominally in 2004 (WCS 2008) by a nationwide presidential decree banning hunting, but this ban was not generally enforced. In 2009 the species was listed on Afghanistan's Protected Species List, making any hunting or

trade within the country illegal. The species does not occur in any protected areas. Proposed conservation measures include:

1. identify remaining populations, their distribution and numbers;
2. facilitate the development of community-based conservation in areas with extant populations or with potential for immigration of Markhor from neighboring countries and establish conservation incentives;
3. raise public awareness about the conservation importance of the country's Markhor populations and potential benefits from their sustainable use;
4. develop trans-boundary collaboration between nature conservation authorities and community based initiatives, including the prevention of cross-border poaching (Petocz 1972; Petocz and Larsson 1977; Valdez 2008; Moheb and Mostafawi 2011, 2012; Michel *et al.* 2014). Urgent measures are required to conserve the straight-horned "Kabul" Markhor *C. f. megaceros* if still extant. Surveys to assess numbers and distribution are important. Local people's support for its conservation is essential, but this will be difficult to obtain, as the initiation of community-based hunting management is currently not possible due to the hunting ban and the difficult security situation in the area.

In India, Markhor is a fully protected (Schedule I) species under Jammu and Kashmir's Wildlife (Protection) Act of 1978 (Ganhar 1979). Currently, Markhor in India occur in only three small protected areas: the Limber Game Reserve, and the Lachipora and Hirapora Wildlife Sanctuaries. Conservation measures proposed include:

1. raise awareness among the army, policy makers and local people about the rarity of the Markhor and the importance of the region for its conservation;
2. the largest Markhor population, in Kajinag, merits the establishment of a protected refuge and the state's Wildlife Department has already initiated a move to set up the Kajinag National Park;
3. involve local people, especially nomadic herders and the armed forces, in the conservation of Markhor, including the realigning of grazing practices so that important areas of Markhor habitat are excluded from grazing, and as much as possible mitigating the larger impacts due to fencing and insurgency (Bhatnagar *et al.* 2009);
4. consider future re-introductions to previously inhabited ranges in the Pir Panjal mountains.

In Pakistan, the Markhor is completely protected by federal law (Rao 1986). In 1991, the Federal government imposed a 3-year ban on all big game hunting. This ban officially lapsed in 1993 but practically remained in effect, although it was ignored in the case of community-based trophy hunting programs (Shackleton 2001). The central government has issued permits only where a community-based trophy hunting program has been established; as of 2000, 80% of the permit fees were mandated to go to the community and 20% to provincial authorities in charge of nature conservation (although inter-community and provincial-federal disputes over receipts and permitting have occurred). The program continued through 2013 with trophy price for Markhor increasing from US \$ 18,000 to about US \$ 80,000-100,000. According to official records, between 1998 and 2008 approximately US \$ 830,000 was distributed to communities within the former NWFP from hunter remittances from the 17 Markhor taken during this period (A. Khan unpublished data, NWFP Wildlife Management, 2008). With higher trophy fees during the last years, significantly higher contributions to the local communities have created substantial incentives for the conservation of Markhor in the participating conservancies. However, the small number of permits issued by the government (up to 12 per annum in accordance to the CITES export quota) may prevent an extension of the approach into still unmanaged areas.

In Pakistan several protected areas contain Flare-horned Markhor: Khyber-Pakhtunkhwa - Chitral District: Chitral Gol NP, Drosh Gol GR, Gahirat Gol GR, Goleem Gol GR, Goleen Gol GR, Purit Gol- Chinar Gol GR, Tushi GR (NWFP 1992); Swat District: Totalai GR (Zool. Survey Dept., 1987). Gilgit-Baltistan – Central Karakoram NP (in Hunza-Nagar, Gilgit and Skardu Districts) Gilgit District: Kargah WS, Naltar WS, Danyore GR, Sherqillah GR. (Rasool, no date); Astor District: Astor WS, Tangir GR (Rasool, no date); Baltistan District: Baltistan WS, Askor Nallah GR (Rasool no date). Azad Jammu and Kashmir - Muzaffarabad: Mauji CR, Qazi Nag GR, Hillan CR (Zool. Survey Dept. 1986); Poonch District: Phala GR (Qayyum 1986). Only one protected area is known to contain straight-horned markhor in Pakistan: Sheikh Buddin NP (previously a Wildlife Sanctuary) in Dera Ismail Khan District of NWFP (Zoological Survey Dept. 1987). The status of the subspecies in protected areas in Baluchistan is uncertain. Its occurrence is not confirmed in Chiltan-Hazarganji NP, and there is no reliable information for either Sasnamana or Ziarat Juniper WS's. There are no reports of markhor in protected areas in Punjab.

The Torghar Conservation Project in Baluchistan has reduced poaching and competition by livestock (Johnson 1997; Frisina and Tareen 2009); the markhor population in this area is reported to have increased steadily since initiation of the program (Rosser *et al.* 2005, Frisina and Tareen 2009, Frisina, Montana State University, pers. comm. 2014). The TCP is the oldest community-controlled program in Pakistan and has been so successful that tribal groups in other mountain ranges of Baluchistan have expressed interest in setting up similar programs (Frisina and Tareen 2009, Ahmed *et al.* 2001).

Throughout Diamer, southern Gilgit, and Astore Districts of Gilgit-Baltistan community based conservation programs aimed at Markhor conservation have created over 40 community conservation organizations and 18 registered conservancies, and trained and deployed over 100 community rangers. Markhor are now well-protected and appear to be experiencing a significant recovery (WCS 2012).

Proposed conservation measures include:

1. treat Kargah Wildlife Sanctuary as a focal area for Markhor and enforce protection measures. Kargah is probably the best place for Markhor in the Gilgit District, and like the Chitral Gol, should be rather easy to control because it is a traditional wildlife sanctuary and is close to Gilgit;
2. adopt a similar procedure for the area around Bagheecha in the Indus valley, which is one of the best places in Baltistan for Markhor and also relatively easy to control and to the Haramosh and Sikandarabad valleys (in Hunza-Nagar District) in the region of Central Karakoram National Park;
3. develop a conservation and management plans that includes information on the status and distribution of *C. f. megaceros* in the areas it still inhabits outside the Torghar conservancy; consider the area of Koh-e Sulaiman and the Takatu hills as a focal area for conservation efforts and include participatory management in the tribal areas in this plan;
4. retain the hunting ban (with its exception for approved community-based trophy hunts);
5. encourage the development of community-based hunting management areas in currently unmanaged areas and buffer zones of national parks, and consider a slight increase of the annual quota to ensure more equitable access to benefits from trophy hunts for all conservancies (with quota set on the basis of monitoring results).

In Tajikistan, Dashtijum Strict Nature Reserve (zapovednik) with an area of almost 20,000 ha was established in 1973, but since the early 1990s poaching has become common, and the security situation deteriorated due to incursions by Afghans (Michel 2010, Moheb and Mostafawi 2011). Markhor are legally protected, but hunting by foreigners was permitted (at

least two Markhor/year) in the early 1990s (Weinberg *et al.* 1997). For the hunting season 2013-2014 the Government of Tajikistan issued a hunting quota of six Markhor, and five were taken by foreign hunters. Hunts are restricted to conservancies established and managed by local small family businesses and community based non-governmental organizations. About 80% of the Markhor recorded by the recent survey (Alidodov *et al.* 2014) were in these conservancies. All captive Markhor in Dashtijum and Romit Strict Nature Reserves and the introduced animals in Romit were poached during civil unrest during the 1990s.

Proposed conservation measures include:

1. strengthening community-based conservation and management through secure rights and obligations for conservancies, issuing of area-specific hunting quotas based on survey results, issuing of import permits for hunting trophies and sharing of benefits with local communities;
2. prevention of assignment of hunting rights to non-locals and business structures and of illegal trophy hunts;
3. reducing poaching through trans-boundary collaboration, community-based hunting management and law enforcement;
4. reducing the risk of disease transmission from domestic sheep and goats by implementing grazing regulations minimizing direct and indirect transmission risks, monitoring the presence of infectious agents in domestic stock and implementing efficient vaccinations on domestic sheep and goats at least against CCPP and Peste des Petits Ruminant disease;
5. preservation of the quality of habitat through regulation of forest use and grazing.

In Turkmenistan the species is legally protected. Markhor occur in the Kugitang Strict Nature Reserve (zapovednik), established in 1986 and covering about 27,000 ha. Lukarevsky (2002) suggested that ecotourism and trophy hunting may provide incentives for the conservation of Markhor. Weinberg *et al.* (1997) suggested enlarging the Kugitang Strict Nature Reserve because it protects only the high elevation summer habitat of Markhor and the currently unprotected lower winter ranges are grazed by livestock. Critical for any consideration of a potential trophy hunting programme would be the full involvement of local community members and a benefit sharing mechanism which would ensure their support.

In Uzbekistan, trophy hunting of Markhor took place in the 1990s (e.g. two in 1994; Weinberg *et al.* 1997) and until about 2005, including hunting in an enclosure containing a small captive group, which no longer exists (S. Zagrebina pers. comm. 2013). The EU Scientific Review Group in 2006 expressed a negative opinion on the import of Markhor trophies originating from the wild, which led to a suspension of trade in 2007. Markhor in Uzbekistan occur in the Surkhan Strict Nature Reserve (zapovednik). With assistance by a UNDP/GEF project during 2008-13 a managed buffer zone was established, encompassing all current Markhor habitat outside the strict nature reserve. Collaboration between the Kugitang (Turkmenistan) and Surkhan Strict Nature Reserves would be of utmost importance for the conservation management of this trans-boundary subpopulation.

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