



MARKHOR

THE JOURNAL OF ZOOLOGY

<https://www.markhorjournal.com/index.php/mjz>
Volume 3, Issue 2 (Jul-Dec 2022)



Review Article

Conservation, Management and Threats to Markhor Population in Pakistan: An Overview

Roheela Yasmeen¹, Faheem Hafeez¹, Aisha Waheed Qurashi¹, Sumaira Mazhar¹, Aneeza¹, Samar¹, Farah Ahmad¹, Rida Arif¹, Sundas Nisar¹, Aansa Khatoon¹ and Nimra Ijaz¹

¹Department of Biology, Lahore Garrison University, Lahore, Pakistan

ARTICLE INFO

Key Words:

Markhor, Conservation, Threats, Decline, Agencies

How to cite:

Yasmeen, R. ., Hafeez, F. ., Qurashi, A. W. ., Mazhar, S. ., ., A. ., S., Ahmad, F. ., Arif, R. ., Nisar, S. ., Khatoon, A. ., & Ijaz, N. . (2022). Conservation, Management and Threats to Markhor population in Pakistan: An Overview: Markhor Population in Pakistan. MARKHOR (The Journal of Zoology), 3(02). <https://doi.org/10.54393/mjz.v3i02.38>

*Corresponding Author:

Roheela Yasmeen

Department of Biology, Lahore Garrison University, Lahore, Pakistan
roheelayasmeen@lgu.edu.pk

Received Date: 19th July, 2022

Acceptance Date: 16th December, 2022

Published Date: 31st December, 2022

ABSTRACT

Markhor is a national animal of Pakistan. It is present in different regions of KPK, Baluchistan and Sindh with majority of the population in KPK region. Generally, five species of Markhor are present in different areas of Pakistan and they differ from each other on the basis of their location and their horns. Its status is endangered in Pakistan and major reasons for its decline are habitat loss, hunting and poaching etc. An increase in hunting has been observed in last few decades due to its skull and meat importance. Although a lot of conservations programs are involved for the protection of this animal and various different national and international agencies are also working on it such as NWFP wildlife department etc. The agencies are collecting funds from different sources like tourism to protect this animal. The present review highlights the importance of Markhor along with its distribution, major threats and conservation strategies adopted to protect Markhor in Pakistan.

INTRODUCTION

Pakistan have a wide variety of wild goat and sheeps belongs to sub family Caprinae and family bovidae. There are seven Caprinae species which are found in Pakistan, and further partitioned into 12 subspecies [1]. Markhor is one of the members of family Bovidae and sub family Caprinae [2], which was firstly portrayed by Wagner in 1839 [3]. The word Markhor is imitative of Persian linguistic means snake eater. However, it is mostly considered as Pashto driven word "MAR Akhkar". "MAR" represents snake and "Akhkar" to horns. Later with passage of time, the word becomes Markhor. Almost five sub species of markhor are found in Pakistan and recognized as Astor Markhor (*Capra falconeri falconeri*), Kashmir or Pir Panjal Markhor (*Capra falconeri cashmiriensis*), Kabul Markhor (*Capra falconeri megaceros*), Suleiman Markhor (*Capra falconeri jerdoni*),

and Chiltan markhor (*Capra falconeri chiltanensis*). The first four are known as subspecies of markhor while, the Chiltan markhor is considered as a mixture of obvious markhor and wild goats [4].

Description of Markhor

Markhor have solid and nearly short legs with expansive hooves. Its fur color is from brown to blackish brown or dim. Adult male sizes are between 99-104 cm at the shoulder and total body length is 132- 185 cm. Females are much smaller than males. These animals are diurnal in feeding habits and found very active at early morning and late evening during the summer, however in winter they feed discontinuously for the duration of the day. When the ground is covered in snow, markhor graze mostly on the leaves of oak trees, whereas throughout the summer they consume more forbs

and grasses [2]. This showed feeding habits and food priorities are changed with the season and accessibility. The mating season begins in late October and continue till early December. The development period is approximately 160 to 170 days [1].

Habitat and Distribution

In compared to other Capra members, Markhor is a goat with low heights, existing between 700 and 1000 m along the Suleiman range's lower slopes. However, in winter they reached up to 2700 m and in summer till 4000 m in Chitral valley. It lean toward regions with abrupt slants and bluffs getting little precipitation [5]. A provisional distribution of Markhor species has shown in Figure 1.

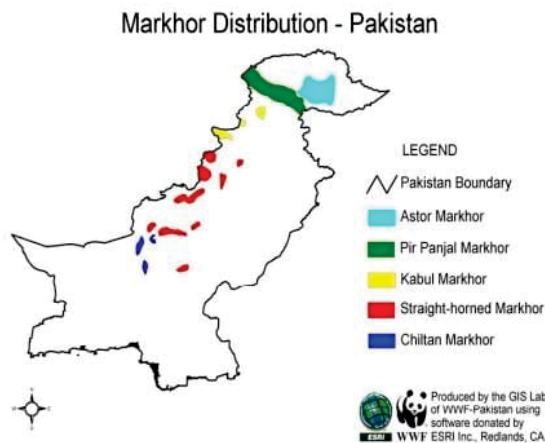


Figure 1: Distribution of Markhor in Pakistan

Number of Markhor Species in Pakistan

In the Chitral Division, there are over 800,000 Markhor. Review reports indicated that the Swat, Chitral, and Dir Kohistan Divisions included 1400 markhor [6]. The IUCN declared all markhor subspecies to be endangered in 1996. People are the essential hunters of the markhor. Since markhor occupy exceptionally steep and difficult to reach hilly territory, a few fortresses of Markhor species often approached by humans. Snow leopards, Wolves, Black bear are predator of Markhor [7].

Economic Importance of Markhor

Markhor as national animal have cultural, social and economic value in Pakistan [8]. It has distinguishing features which caught the attention of many hunters and illegal poaching because of its skin coat, fur and horns [9]. As a result of illegal shooting or hunting, in 1980s first time entire inhabitants of Urial and Markhor was assessed with 200 heads [10] which portrayed a great decline in its normal distribution in the region. Poorly enforced legislations made it possible for many hunters to chase Markhor and its poaching rate is increased exponentially due to money [11]. Although this amount is supposed to be used for conservation purpose, but surveys proved its negative impacts on the biodiversity of species [12]. Due to

increased demand of Markhor's skull and meat, its trophy trafficking is increasing on a vast scale [13].

Change in Population Growth

The data of two years (2015–2017) have been collected from five different districts of Gilgit Baltistan. An enumeration of 1087 animal species in 15 community controlled hunting areas have been found. It includes 24%, 36% 21% and 19% males, females, youngsters and toddlers respectively. Generally, provinces contain total population growth of about 0.13 animal per kilometer. The population growth and density of Markhor species in several areas was recorded, firstly kargah become at the peak point having 211 species, then Bunji having 187 number of species. 119 species in doyan, 75 range in sakwar-jutial-barmas and 74 in tangir area etc. In Pakistan, there are total five number of subspecies of Markhor. One subspecies is so-called as chiltan Markhor commonly known as wild goat. Remaining four subspecies divide into two straight horned Markhor (SHM) and two flare horned Markhor (FHM). The total number of FHM was approximately counted as 1500, while SHM was lower than 2000 species. Markhor species have versatile habitat that have ability to live in temperature ranges from 45 or above [14]. Due to community based hunting programs, Markhor conservative status become endangered in 2015, change into near to threatened species in 2018. In Chitral Gol national park, population growth of Markhor increasing day by day. In 1990, only 154 species was found but number of species increase in 2006 survey up to 612 species (Figure 2) [15, 16].

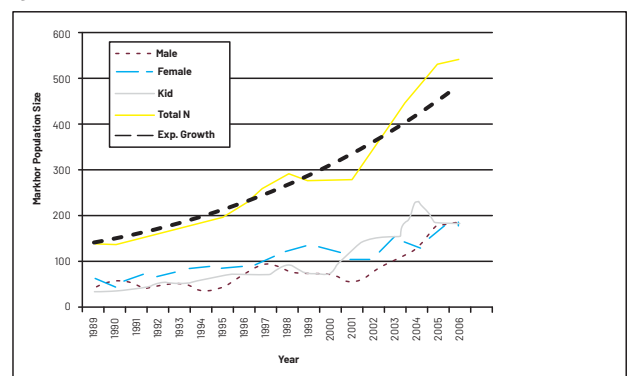


Figure 2: Markhor population trend in Chitral Gol National Park, Chitral, NWFP, Pakistan

Threats to Markhor

All five sub-species of Markhor are at forefront of threats which includes the habitat loss, lack of incentives, poaching, lack of operational fund, lack of public awareness and deforestation etc. [17, 18]. The conservation status of Astor Markhor in Pakistan is endangered [19]. One of the major problems is habitat loss which plays a vital role

in extinction of Markhor habitat. The victims of habitat loss include chinkara (*Gazella gazelle*), goral, hog deer (*Axis porcinus*). The factors which effect the habitat of Markhor are over population of human, more usage of wood, logs, planks, pasturing, foraging and conquering of alien species [7, 20]. The 1975 Wildlife Act provides for a cash reward but no reward for the staff and insufficient investment demotes the workers. Lack of education is hindrance in conservation [21]. Regional community in NWFP are ignorant of the social and economic welfare for renewable conservation of wildlife. So, it is noticed a lack of knowledge about wise use of wild species, lack of concentration, inadequate budget, and topographical isolation are some reasons for the extinction of hoofed species [22]. In many villages, cities and countryside's the hunting of Markhor for meat, trophy as a means livelihood is major problem in declination of its number [23]. Other than protected areas hunting, poaching of Markhor species take place which can be controlled by involving local communities or Government [20].

Working on the Conservation of Markhor

It is reported that different species of Markhor are present in mountainous regions of Baluchistan and KPK and threats to biodiversity are noticed [24]. The third world countries are more on the verge of these threats [25]. There must be some conservation programs for the conservation of Markhor. Local inhabitants, non-governmental associations (NGOs) and the public authority have taken steps for biodiversity protection in the northern zones of Pakistan. There is a private preservation program named as Torghar Conservation project (TCP) established in 1986 after discussion with Pathan ancestral pioneers and qualified natural life scientists from the USA. TCP has its fundamental target the reclamation and preservation of the Suleiman Markhor (*Capra falconeri megaceros*), and the Afghan urial (*Ovis orientalis cycloceros* in the Torghar Slopes of Qilla Saifullah Locale, Baluchistan, Pakistan [26]. Some other aims of this project are social and monetary government assistance programs for individuals of the TCP region which assumes an imperative part in making the motivations for the tribesmen's families [27]. In past few years (1997-2001) of extreme dry spell, which greatly lessened the quantities of their livestock, the nearby individuals inside the TCP region have chosen to create and introduce a supportable administration plan for their domesticated animals and other natural life found in that region. Moreover, they decided to prevent their animals from grazing in the region so the flora can be conserved for the wild animals like Markhor [28, 29]. These plans and progress of the TCP improved by a NGO, called the Society for Torghar Environmental Protection (STEP), made to deal with the TCP as a community-based, government-

perceived, and non-benefit preservation organization.

Role of National and International Agencies in Conservation of Markhor

With unique consent from Refers to, the Untamed life Branch of the North West Outskirts Region sent off a local area based Markhor prize hunting program in 1997. To advance nearby networks' contribution in the protection of Markhor and other significant creature species, 80% of the permit installments are placed into a Town Preservation Asset (VCF). Neighborhood viewpoints on untamed life have changed as a result, prompting an expansion in the quantity of Markhor in local area oversaw protection regions. The NWFP WD ought to get acknowledgment for this accomplishment since nearby occupants effectively partook in the security of regular assets. [30]. In 1992, CITES moved all *Capra falconeri* subspecies and populations from Appendix II to Appendix I. In 1997, the Conference of Parties to the Convention on International Trade in Endangered Species (CITES) issued a resolution permitting an annual export limit of six Markhor trophies from Pakistan's community-based hunt market sectors to CITES-accredited countries [31, 32].

Wildlife Conservation Society

The Markhor's recent historical trajectory has been one of rapid decline, the WCS community-based conservation programme has been a huge success in saving Markhor and restoring them to a place of pride (as well as ecological and economic value) in Gilgit-Baltistan. Since 1997, WCS has been working in the heart of the flare-horned Markhor distribution. Illegal hunting and harvesting have ceased in most of the valleys where WCS trained community rangers are working as a result of this programme. The rangers' wildlife tracking has also revealed that the Markhor population is increasing: the latest figure is that there are roughly 1,700 Markhor in the programme landscape, representing a 70 percent rise in the population over the previous 15 years. The WCS Pakistan Program now touches 65 villages in Gilgit-Baltistan, influencing over 400,000 inhabitants, and covering an approximately 80% of the Markhor territory. In several of these valleys, Wildlife Conservation Society is the sole animal protection NGO working full-time [33].

Conservancy by the Parks & Wildlife Department Gilgit-Baltistan

Markhor are also tracked and safeguarded while on the move. To assist protect the animals, a new programme called "Markhor conservancy" has been devised, in which Markhor home grounds are used to connect separate village resource committees [34]. In 2014, a study was conducted in Jutial Conservancy, District Gilgit, and Gilgit-Baltistan, to determine the rank of the flare-horned Markhor (*Capra falconeri falconeri*). The findings of the

survey revealed the existence of 162 adult Markhor, with a number of kids. The study's findings further support the preservation interventions, particularly the trophy hunting programme launched in the Conservancy by the Parks and Wildlife Department Gilgit-Baltistan and the Wildlife Conservation Society, as a successful example of community-based Markhor preservation in the region that can be replicated in other parts of the species' range for joint management of Markhor and other natural resources, as well as to improve local populations' livelihoods [8].

Funding for Conservation of Markhor

With unique consent from Refers to, the Untamed life Branch of the North West Outskirts Region sent off a local area based Markhor prize hunting program in 1997. To advance nearby networks' contribution in the protection of Markhor and other significant creature species, 80% of the permit installments are placed into a Town Preservation Asset (VCF). Neighborhood viewpoints on untamed life have changed as a result, prompting an expansion in the quantity of Markhor in local area oversaw protection regions. The NWFP WD ought to get acknowledgment for this accomplishment since nearby occupants effectively partook in the security of regular assets [35].

CONCLUSIONS

It was concluded in the study although Markhor species are endangered from local areas of Pakistan due to habitat loss and overhunting of it for meat and horns. However, the species can be preserved by the involvement of various private and Government organizations and public education.

Conflicts of Interest

The authors declare no conflict of interest

Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article

REFERENCES

- [1] Roberts T. The Mammals of Pakistan, Ernest Benn. The Mammals of Pakistan, London. 1977; 26: 361.
- [2] Schaller GB. Mountain monarchs. Wild sheep and goats of the Himalaya. University of Chicago Press.; 1977. 425
- [3] Huffman DW and Moore MM. Ungulate herbivory on buckbrush in an Arizona ponderosa pine forest. *Journal of Range Management*. 2003; 56(4). doi:10.2458/azu_jrm_v56i4_huffman
- [4] Shackleton DM. A review of community-based trophy hunting programs in Pakistan. IUCN, the World Conservation Union; 2001 Jan.
- [5] Roberts TJ. A note on *Capra falconeri* (Wagner, 1839). *Zeitschrift fur Saugetierkunde*. 1969; 34: 238-49.
- [6] Ali S. Conservation and status of markhor (*capra falconeri*) in the northern parts of north west frontier province, Pakistan. 2008.
- [6] Ashraf N, Anwar M, Hussain I, Nawaz MA. Competition for food between the markhor and domestic goat in Chitral, Pakistan. *Turkish Journal of Zoology*. 2014; 38(2): 191-8. doi: 10.3906/zoo-1306-6
- [8] Khan M, Siddiqui PA, Raza A, Zahler P. Status of flare-horned markhor (*Capra falconeri falconeri*) in Jutial Conservancy, District Gilgit, Gilgit-Baltistan (previously northern areas), Pakistan. *International Journal of Biology and Biotechnology*. 2018 Sep; 15(2): 343-9.
- [9] Koul GL, Biswas JC, Bhat PN. The Cheghu (pashmina) goat of the Himalayas. *Small Ruminant Research*. 1990 Jul; 3(4): 307-16. doi: 10.1016/0921-4488(90)90012-U
- [10] Johnson KA. Status of Suleiman markhor and Afghan urial populations in the Torghar Hills, Balochistan province, Pakistan. *Biodiversity of Pakistan*. 1997: 469-83.
- [11] Michel S, Michel TR, Saidov A, Karimov K, Alidodov M, Kholmatov I. Population status of Heptner's markhor *Capra falconeri heptneri* in Tajikistan: challenges for conservation. *Oryx*. 2015 Jul; 49(3): 506-13. doi: 10.1017/S0030605313000860
- [12] Rashid W, Shi J, Rahim IU, Dong S, Sultan H. Issues and opportunities associated with trophy hunting and tourism in Khunjerab National Park, Northern Pakistan. *Animals*. 2020 Apr; 10(4): 597. doi: 10.3390/ani10040597
- [13] Michel S. Community based conservation and management of mountain ungulates in Tajikistan. *Galemys: Boletín informativo de la Sociedad Española para la conservación y estudio de los mamíferos*. 2010; 22(1): 469-81.
- [14] Prater SH. The book of Indian animals. Bombay natural history society; 1965.
- [15] Khan MZ, Begum F, Riaz M, Khan B, Karim R, Ali K, et al. Predicting the potential impacts of trophy hunting on population structure of himalayan ibex (*capra sibirica*) in Northern Pakistan. *Polish Journal of Ecology*. 2019 Dec; 67(3): 264-70. doi: 10.3161/15052249PJE2019.67.3.008
- [16] Nawaz MA, Din JU, Shah SA, Khan AA. The trophy hunting program: enhancing snow leopard prey populations through community participation. *Snow leopards: Biodiversity of the world: Conservation from genes to landscapes*. 2016: 220-9.
- [17] Bhatnagar YV, Ahmad R, Kyarong SS, Ranjitsinh MK, Seth CM, Lone IA, et al. Endangered markhor *Capra falconeri* in India: through war and insurgency. *Oryx*.

- 2009 Jul; 43(3): 407-11. doi: 10.1017/S0030 60530900 1288
- [18] Shackleton DM. Wild sheep and goats and their relatives: status survey and conservation action plan for Caprinae. 1997.
- [19] Sheikh KM and Molur S. Status and red list of Pakistan's mammals. In Based on the Conservation Assessment and Management Plan Workshop. IUCN Pakistan 2004 Dec.
- [20] Arshad M, Qamer FM, Saleem R, Malik RN. Prediction of Kashmir markhor habitat suitability in Chitral Gol National Park, Pakistan. Biodiversity. 2012 Jun; 13(2): 78-87. doi: 10.1080/14888386.2012.684206
- [21] Norris KS and Jacobson SK. Content analysis of tropical conservation education programs: Elements of success. The Journal of Environmental Education. 1998 Jan; 30(1): 38-44.
- [22] Jacobson SK. Evaluation model for developing, implementing, and assessing conservation education programs: examples from Belize and Costa Rica. Environmental Management. 1991 Mar; 15(2): 143-50. doi: 10.1080/00958969809601862
- [23] Loibooki M, Hofer H, Campbell KL, East ML. Bushmeat hunting by communities adjacent to the Serengeti National Park, Tanzania: the importance of livestock ownership and alternative sources of protein and income. Environmental Conservation. 2002 Sep; 29(3): 391-8. doi: 10.1017/S0376892902000279
- [24] Schaller GB. Mountain mammals in Pakistan. Oryx. 1976 Jul; 13(4): 351-6. doi: 10.1017/S003060 530001 4071
- [25] Baig MB and Aldosari F. An investigation into the vanishing biodiversity: implications for rural extension. Bulgarian Journal of Agricultural Science. 2012; 18(3): 403-9.
- [26] Qasim S, Khan AN, Qasim M. A Comparative Study of Conservation Strategies of Two Selected National Parks from Pakistan & Thailand: Lessons learned from each other. Journal of Managerial Sciences. 2014 Jan; 8(1): 61-75.
- [27] Frisina MR. Suleiman markhor (*Capra falconeri jerdoni*) and Afghan urial (*Ovis orientalis cycloceros*) population status in the Torghar Hills, Balochistan Province, Pakistan. Society for Torghar Environmental Protection; 2000 Mar.
- [28] Woodford MH, Frisina MR, Awan GA. The Torghar conservation project: management of the livestock, Suleiman markhor (*Capra falconeri*) and Afghan urial (*Ovis orientalis*) in the Torghar Hills, Pakistan. Game and Wildlife Science. 2004; 21(3): 177-87.
- [29] Frisina MR. Implementing effective rangeland management in Montana: What works?. In Proceedings of the Montana Academy of Sciences (USA) 1989; 49: 19-21.
- [30] Frisina MR, Woodford MH, Awan GA. Habitat and disease issues of concern to management of straight-horned markhor and Afghan urial in the Torghar Hills, Balochistan Province, Pakistan. unpublished report to STEP and USFWS. 2002.
- [31] Saunders J and Reeve R. The EU timber regulation and CITES. Energy, Environment and Resources PP EER. 2014 Apr; 8.
- [32] List R. Support the IUCN Red List. 2015 Feb: 1-22
- [33] Arshad M, Malik RN, Saqib Z. Assessing potential habitats of Kashmir Markhor in Chitral Gol National Park, Khyber Pakhtunkhwa, Pakistan. Pakistan Journal of Botany. 2013 Jan; 45(S1): 561-70.
- [34] Woodford MH, Frisina MR, Awan GA. The Torghar conservation project: management of the livestock, Suleiman markhor (*Capra falconeri*) and Afghan urial (*Ovis orientalis*) in the Torghar Hills, Pakistan. Game and Wildlife Science. 2004; 21(3): 177-87.
- [35] Martínez-Abraín A and Oro D. Preventing the development of dogmatic approaches in conservation biology: A review. Biological Conservation. 2013 Mar; 159: 539-47. doi: 10.1016/j.biocon.2012.10.020