



Snow Leopard (*Panthera uncia*) Status in Afghanistan

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1. Distribution

Several approaches have been used in the last few decades to draw both contemporary and historical ranges for snow leopard (*Panthera uncia*) in Afghanistan (Habibi 2003, Hunter & Jackson 1997, McCarthy & Chapron 2003, Moheb et al. 2024). Building on the previous distribution range, the Wildlife Conservation Society (WCS) conducted comprehensive habitat modelling in 2008 by combining previous survey records and priority zone analysis to produce a tentative distribution map for the snow leopard range in Afghanistan (Kanderian et al. 2009, Moheb & Paley 2016). As part of the effort to craft the snow leopard country chapter for Afghanistan for the 2nd edition of the book *Snow Leopards* (Mallon & McCarthy 2024), Moheb et al. (2024) further enhanced the species distribution map with recent survey data and other field records. The map produced by Moheb et al. (2024) depicts the distribution range in three categories: areas where the presence of the species has been confirmed through direct or indirect observations (camera trap data and other confirmed records); areas where presence of the species is likely as reported during interviews with local communities; and habitat suitable for snow leopards but where the recent presence of the species has yet to be confirmed.

Camera trapping and other field surveys have recorded evidence of snow leopards in Wakhan, Zebak and Ishkashim districts of Badakhshan (Moheb et al. 2024). Whereas other direct records of the species come from predation incidents reported by media, e.g., two snow leopard livestock predation (and subsequent capture) incidents were reported from Maymai District of Darwaz in northern Badakhshan

in 2019 and 2020 (Moheb et al. 2023, Moheb et al. 2024). Moreover, a snow leopard captured and GPS-collared in Pakistan crossed the border into Afghanistan and confirmed the presence of the species in eastern Nuristan (Chadwick 2008). Questionnaire surveys reported the presence of snow leopard in the eastern heights of Paryan District in Panjshir that borders Nuristan and Badakhshan and is within suitable habitat.

To date the potential geographical spread of the snow leopard range covers 10 provinces in north and north-eastern Afghanistan. These include parts of Badakhshan, Baghlan, Kapisa, Kunar, Laghman, Nangarhar, Nuristan, Panjshir, Parwan, and Takhar with the current confirmed presence areas being only in Badakhshan and Nuristan provinces. However, due to several decades of unrest in Afghanistan, most suitable snow leopard habitat is unexplored; therefore, part of the distribution range where snow leopard is confirmed is likely to increase in the future. As an example, a snow leopard livestock predation incident was reported for the first time from Keran-wa Munjan District of Badakhshan in 2023 (Moheb et al. 2023), after the snow leopard chapter for Afghanistan was published (Mallon & McCarthy 2024).

Taking all previous and current records into consideration, we revised the map published by the snow leopard chapter for Afghanistan (Moheb et al. 2024) and here we present an updated distribution map for snow leopards in Afghanistan (Fig. 1). The map presented here (Fig. 1) is slightly different from the map found in Moheb et al. (2024). Based on the mapping criteria required by the IUCN Red List, we divided the snow leopard previously known areas (Moheb et al. 2024) and recently confirmed places in two categories of “Extant” (~19,850 km²) and “Possibly Extant” (~32,505 km²) areas. “Extant” areas include all the areas with confirmed presence, and “Possibly Extant” include the areas where presence of the species has either been reported by local communities or the areas have been classified as likely habitat for the species based on a distributional gap analysis and habitat modelling conducted by WCS in 2009 (Kanderian et al. 2009).

Except for areas determined by the habitat modelling, the other records have been roughly georeferenced using district boundaries (the smallest administrative unit in the country) where the species has been directly recorded or reported by local communities during interviews and field surveys. Although using the district boundaries is not ideal

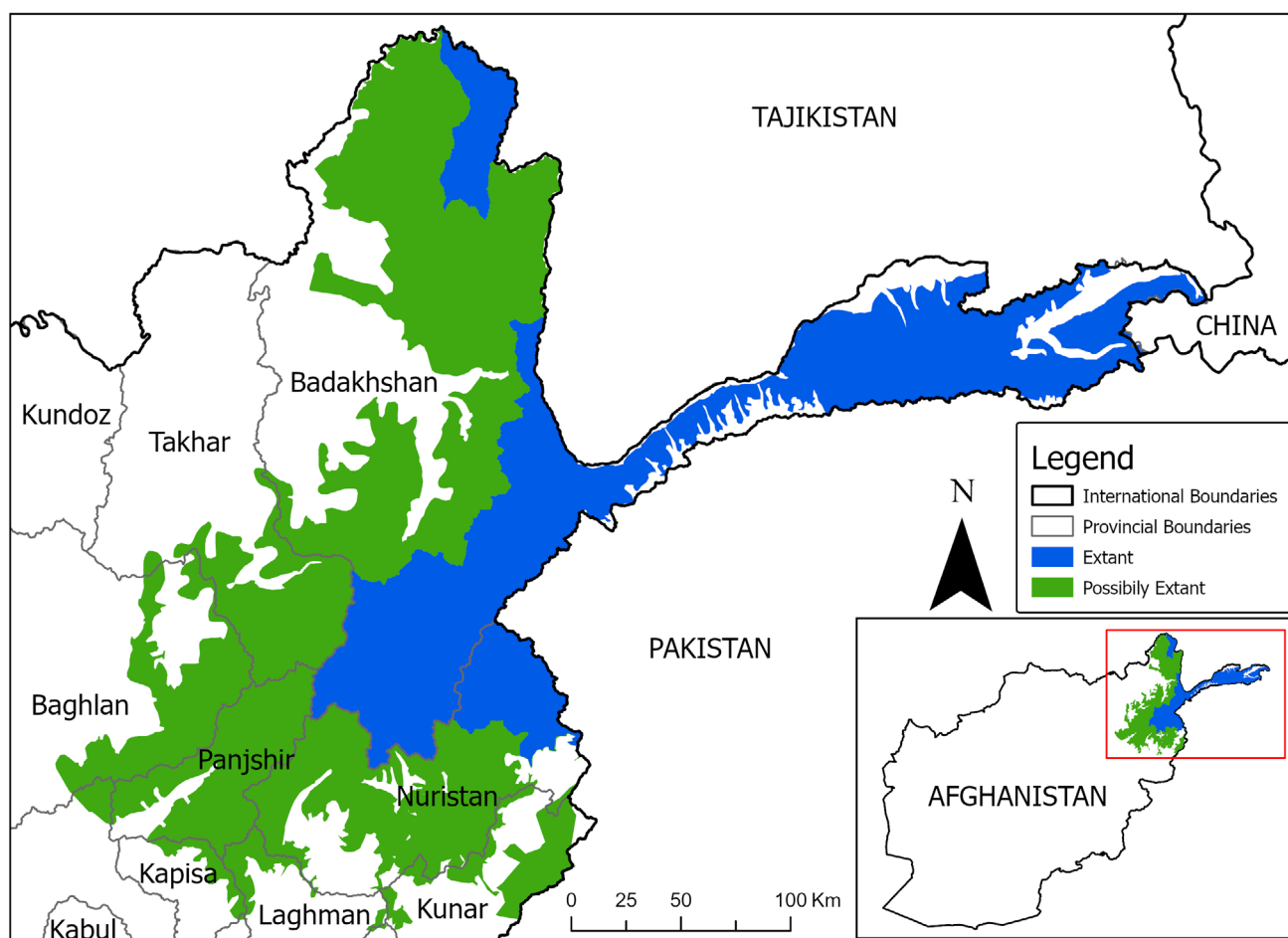


Figure 1. Proposed map for snow leopard distribution in Afghanistan: the updated version of the map produced for the snow leopard chapter for Afghanistan by Moheb et al. (2024).

and precise, we found no other alternative to classify the area as the species range. In addition, given that a snow leopard has traveled up to 45 km in a straight line in Afghanistan based on telemetry data (S. Ostrowski pers. comm., 2025) and the largely contiguous mountain topography of the area in northeastern Afghanistan, it is likely that the snow leopard uses most of the areas in the district where it has been recorded or reported.

2. Population

Although the snow leopard is a relatively widely studied animal in Afghanistan, there has been no comprehensive snow leopard population assessment at the national level. Nevertheless, based on camera trap studies of snow leopards in low, medium and high-density habitats in Wakhan National Park, WCS estimated a crude density of the species for different types of habitats in Afghanistan (Ostrowski & Moheb 2021). Following the steps articulated by Ostrowski & Moheb (2021), we extrapolated the population estimates to the areas recently added to the species confirmed range and came up with a rough population estimate of 213–253 adult snow leopards in Afghanistan.

Since there has been no systematic and inclusive population survey throughout the species range in the country, there are no data on sub-populations nor any information on population trends in Afghanistan. However, questionnaire surveys carried out in Nuristan (Karlstetter 2008), northern Badakhshan (Moheb & Mostafawi 2012, 2013), and Panjshir (Moheb et al. 2024) suggested an overall likely decline in snow leopard populations in those three areas. Nevertheless, the nearly two decades of conservation programs and community engagements have likely had a positive impact in raising public awareness and positive attitudes towards snow leopard in general across Wakhan National Park (Zahler & Paley 2024). Long-term camera trap research by WCS suggests that the Hindu Kush range in the western part of the national park contains the largest population of snow leopard in Afghanistan. In line with this, Wakhan National Park has been listed as one of the 24 globally important snow leopard landscapes throughout the species global range (GSLEP 2013, Sharma et al. 2024).

3. Threats

Threats to the snow leopard population are numerous in Afghanistan, although the lack of research makes it difficult to assess their impacts. Among the major threats are the likely decline in its prey population (ibex *Capra sibirica*, markhor *Capra falconeri*, argali *Ovis ammon polii*, and urial *Ovis vignei*); retaliatory killings over livestock predation

(exacerbated by negative attitudes of local communities towards large carnivores in general, including the snow leopard); wildlife trade and pelt markets; building roads and new infrastructure in snow leopard habitat; and direct and indirect impacts (e.g., poaching) from mining in mountainous habitats where snow leopards are likely to occur.

Although a comprehensive assessment of mountain ungulate populations is missing for Afghanistan, surveys and reconnaissance visits of WCS teams have reported a decline in mountain ungulate populations in several parts of the snow leopard range in Afghanistan (Moheb & Mostafawi 2012, 2013; Moheb et al. 2022). These declines are attributed to illegal hunting for food, competition and disturbance from excessive number of livestock, and habitat degradation due to agricultural and other human activities. A number of poaching incidents from Wakhan National Park were noted during the visits of governmental authorities from Afghanistan's National Environmental Protection Agency (NEPA) and WCS (S. Shirzad pers. comm., 2024).

Despite close attention by the NEPA authorities, local communities express concerns about poaching in Wakhan. The number of urial and ibex showed a significant decline in 2024 compared to the previous monitoring in 2018 (Moheb et al. 2022). Urial and ibex numbers showed over 75% and 60% decline in 2024 compared to what had been counted in 2018 with nearly identical methodologies. This decrease in number of both urial and ibex support the anecdotal reports of high hunting pressure on these mountain ungulates from the armed people in the area. Higher decline in the number of urial that utilize lower and more accessible areas is a substantial indication of heavy hunting pressure in the area. However, ibex, which stay higher up close to cliffs and are relatively less accessible to poachers, showed a slightly lower decline compared to urial.

Apart from some camera trap and telemetry studies carried out by WCS (Simms et al. 2011, Rahmani 2022), most of the snow leopard records from different parts of Afghanistan come from reports of livestock predation and retaliation by local communities (Rajabi 2022, Moheb et al. 2023). Mishra & Fitzherbert (2004) reported 10 cases of snow leopard deaths in Wakhan for the period 1989–2002. In line with that and based on community interviews, Moheb (2020) reported seven cases of snow leopard retaliatory killings for the period of 2008–2018 in Wakhan National Park.

Snow leopard pelts have historically been valuable in the wildlife trade market in Afghanistan. Rodenburg (1977) estimated that 50–80 skins were sold in Afghan markets per

year in the mid-1970s. However, hunting of snow leopard only for its pelt has rarely been reported in recent years. Fur market surveys reported the presence of snow leopard pelts in Kabul and some other cities in 2014, though the origin of the pelts was uncertain (Maheshwari et al. 2016). Prior to mid 2021 there was a large international presence in the country, both from various military units and numerous development agencies, and thus a clear market for fur items. However, no data exist for how often pelts were sold, and during that period many of the furs sold in these shops were said to be imported from other countries (e.g., Russia, Central Asian states), such as full mink and sable coats, so it is certainly possible that some snow leopard pelts were brought in from other countries as well. An illegal wildlife trade survey conducted before the political change in 2021 in different regions of Afghanistan did not find any snow leopard pelts in the fur markets in Afghanistan (M. Bashari pers. comm., 2025).

As part of the land transit expansion in the region, a road construction project has been initiated to connect Afghanistan with China. This road, still under construction, goes through the high altitudes of Wakhan National Park along the Silk Road (Smallwood & Shank 2019) that had previously been far removed from human development. Wakhan National Park, globally considered as an important snow leopard landscape, seems to be the main stronghold of the snow leopard in Afghanistan, yet this road initiative has so far overlooked many of the likely socio-ecological impacts in favour of immediate economic development. This road, connecting Afghanistan with China in the Pamir Knot where the magnificent Asian mountain ranges meet, also exposes the region's natural resources for exploitation that were distanced from economic access for centuries. This road, once completed, will cause landscape fragmentation for the snow leopard and its wild prey in the park and will enable fast access for poachers and wildlife traders.

Other threats to the snow leopard in Afghanistan include mining for minerals in mountainous habitats where snow leopards are likely to occur. While the mining activities may not cause much of a direct disturbance to the snow leopard itself, it can disturb wild prey species occurring in the area. Miners who are busy in heavy duty jobs, very far away from law enforcement personnel, not only disturb wild species with explosives and other mine extraction tools, but they usually have guns and can easily hunt wild species as a good nutritional supply while conducting tedious mining activities.

A lack of clarity about the validity of laws and policies enforced by the previous government to protect the snow leopard when encountered by a human or captured while

attacking livestock poses a huge threat to the species. With the political change in Afghanistan in mid 2021, although there is a general positive intention to protect wild species including the snow leopard, wild species suffer from uneven enforcements of policies and different personal attitudes in different parts of their range. For example, district authorities and NEPA officials in Kabul acted very quickly to rescue a snow leopard that attacked livestock five times within a short period and was trapped on several occasions in 2023 in Wakhan (Moheb et al. 2023); however, not very far from the area, another snow leopard was captured from a corral in Zebak on February 1, 2024, and kept in custody at the provincial governor's office in Faizabad, the capital city of Badakhshan for >21 months before it was transferred to Kabul Zoo, thanks to the tireless efforts by the Kabul Zoo authorities (Fig. 2). Capturing and relocation of depredating snow leopards is becoming a more serious threat to the species in recent years. The news about predator capture and relocation spreads rapidly through social media and people consider this action as a "more acceptable and less illegal" solution than killing problem snow leopards.



Figure 2: The captured female snow leopard was brought to Kabul Zoo in November 2025 after spending nearly two years in custody in Faizabad, the provincial capital of Badakhshan.
Photo courtesy of A.G. Saqib@Kabul Zoo.

The snow leopard and its wild prey suffer from the effects of climate warming across most of their range. A climate change vulnerability assessment conducted by WCS in northeastern Afghanistan revealed that several wild species including the snow leopard and its wild prey (e.g., argali) will face severe habitat loss under high-emissions scenarios (RCP8.5) (Elsen et al. 2023). Using species distribution models, WCS found that by 2100, suitable habitats for snow leopard could shrink by as much as 82% due to rising temperature and ecosystem changes, while low-emissions (RCP2.6) scenarios suggest a relatively stable situation.

The species core habitats in Wakhan and some other parts of northern Badakhshan may persist; however, according to the model, no new high-suitable areas are expected to emerge. This situation highlights the urgent need for climate resilient conservation policies and actions.

4. Conservation

Declaration of Wakhan District (10,950 km²) as a national park in March 2014 was the second largest step taken to conserve snow leopards in Afghanistan, the first being the placement of the species on the Protected Species List of Afghanistan in 2008 (NBSAP 2024). In June 2020, the government of Afghanistan declared Nuristan Province (9,266 km²), where snow leopard presence has been confirmed in the eastern districts of Barg-e Matal and Kamdesh, a protected area. Current efforts carried out by FAO and WCS to confirm the designation of the park and develop its future management are supported by the new administration. Areas with favourable habitats for snow leopards in Panjshir were surveyed before the collapse of the previous government, with the aim to declare new protected areas; however, with the political change in 2021, tensions increased in Panjshir that halted these conservation efforts.

Snow leopards mostly suffer retaliation against livestock depredation and recent trends show that most livestock predation happens during the winter or early spring seasons when some other natural disasters occur as well. There is a government budget allocation to compensate losses due to natural disasters in Afghanistan, which does not cover loss of assets due to snow leopard mass predation (the killing of multiple livestock in a single predation event, as sometimes happens in corrals). It is recommended that snow leopard mass predation also be considered as a natural disaster and thus compensation to be paid to the impacted shepherds to avoid retaliation against the predator.

Wildlife pelt markets can encourage poachers to hunt wildlife for their pelts (although the market for expensive pelts has likely declined with the departure of most international military and development personnel). Strict monitoring and enforcement in wildlife markets is essential to stop wildlife poaching for trade. Afghanistan's National Environmental Protection Agency (NEPA) needs to have close monitoring and enforcement of the fur market in Kabul and other big cities throughout the country.

Infrastructure development within the protected areas is inevitable as the potential long-term economic benefits overshadow the ecological benefits and ecosystem services; however, a strong environmental review should also be

carried out parallel to every infrastructural project at every level. The road cutting through Wakhan National Park is deemed as a very big, nation-wide project that will not only shorten the road access to/from China markets by months but also change the goods transit formula in the region. This leaves no space for conservationists to be able to resist this massive road project cutting through WNP, Afghanistan's main stronghold of wild species and wild places, but there is the possibility to advocate for a strong Environmental Impact Assessment (EIA) of the project site by a reputable environmental conservation professional company. The project EIA should really consider all the ecological needs of the wild species in the area and make sure to build infrastructure to ensure ecological connectivity, animal movements, wildlife management, and prevent overexploitation.

Similar to infrastructure development within and around the protected areas, there can be huge negative impacts from mining, and especially from the miners themselves, on ecosystems if not conducted properly. There should be rules and policies in place for mining within the protected areas so that it minimizes the negative impacts as much as possible.

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6. Conflict of Interest

The authors declare no known conflicts of interest.

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