



**Policy Brief**

# Addressing the impacts of climate change on mountain wildlife and communities

## Tajikistan



# Introduction

Central Asia is highly vulnerable to the impacts of climate change, such as reduced water availability and droughts, which threaten both humans and wildlife. Key species such as the Bukhara deer, argali sheep, and snow leopard adapt by altering their movement patterns and habitat use, which may render existing protected areas ineffective and expose animals to new threats. Linear infrastructure, such as fences and roads, creates barriers to the species' search for suitable habitat and food, reducing their resilience. In addition, livestock grazing has increased in duration and shifted to higher elevations due to climate change, often leading to human-wildlife conflict, poaching, and encroachment on species' habitats. This policy brief provides an overview of the expected climate impacts on wildlife and communities in Tajikistan, and offers concrete recommendations for enhancing the resilience of species and protected area management.



# Observed and projected changes in climate

Tajikistan is located in the transition zone of the South West Asia and East Asia regions, as defined in the Regional Fact Sheet of the IPCC Sixth Assessment Report. The weather and climate trends are further influenced by its specific location in these two areas: Western Central Asia (WCA), within the broader category of South West Asia, and East Central Asia (ECA), within the category of East Asia.<sup>1</sup>

In South West Asia, human-induced warming has amplified droughts and increased extreme precipitation since the 1980s, particularly in high-altitude regions. Over the past decade, mountain permafrost degradation at high elevations has decreased the stability of mountain slopes, while the annual maximum snow amount has declined with elevation in mountainous areas. Climate projections indicate that annual precipitation totals, as well as the intensity and frequency of heavy rainfall events, will rise with increased warming levels. In WCA specifically, this will result in significant spatiotemporal variations, with a general decrease in summer precipitation and an increase in winter precipitation.

In East Central Asia, daily precipitation extremes have increased in parts of the region, heavy rainfall events expected to become more frequent and intense, leading to more frequent landslides in some mountainous areas. Droughts have become more common across much of East Asia, while the arid regions of ECA have experienced increased wetness. Additionally, the frequency and intensity of strong tropical cyclones has increased, and their tracks have likely shifted poleward.

Tajikistan's protected areas experience even more specific weather and climate conditions.<sup>2</sup> The region faces considerable seasonal and

climate variation due to its mountainous terrain, with extremely hot conditions in low-elevation areas and extremely cold conditions in high-elevation areas. For example, in the southwestern lowlands, mean temperatures can range from -10°C in the winter to over 30°C in the summer, while winter temperatures in the eastern mountainous areas can drop below -30°C. Some of the wettest conditions occur in northern and central Tajikistan, especially in the winter and early spring, when total annual precipitation exceeds 2,000 mm. During the summer months, the area experiences an abrupt decrease in precipitation. In contrast, eastern Tajikistan experiences less than 500 mm in total annual precipitation.

As climate change progresses, extremely high temperatures are expected to persist and intensify, with the total annual number of days with recorded heatwaves projected to increase by almost two weeks by 2070. This will also affect agriculture, as the number of days experiencing heatwaves during the growing season will increase as well. A shift in the seasonality of precipitation is also projected to occur in some protected areas in Tajikistan, with precipitation expected to peak in early spring. The amount of precipitation is also expected to shift, with protected areas potentially experiencing up to 40% more heavy precipitation events annually by 2070.

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<sup>1</sup> IPCC Sixth Assessment Report, Working Group I – The Physical Science Basis. Regional fact sheet – Asia. [https://www.ipcc.ch/report/ar6/wg1/downloads/factsheets/IPCC\\_AR6\\_WGI\\_Regional\\_Fact\\_Sheet\\_Asia.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/factsheets/IPCC_AR6_WGI_Regional_Fact_Sheet_Asia.pdf)

<sup>2</sup> Crespi, Alice; Maines, Elena; Renner, Kathrin. 2023. Eurac Research – Analysis and interpretation of climate change scenarios for the 'The Central Asian mammals and climate adaptation project (CAMCA).'

# Perceptions of climate change

In November of 2022 and May 2023, 79 key informant interviews were conducted in Tajikistan following the [Climate Crowd](#) methodology. Of these, 38 were from residents in villages in and around the Yaghnob Valley, located in the south of the northwestern province of Sughd, while 41 were from individuals living near the State Strict Nature Reserve Tigrovaya Balka (Beshai Palangon) in the southwestern province of Khatlon. In Yaghnob, the most commonly reported changes in weather and climate were decreased rainfall (87% of respondents), changes in the timing of seasons (66%), and increased heat waves and hotter days (55%). Similarly, 71% of respondents near Tigrovaya Balka reported decreased rainfall and changes in the timing of seasons, along with drought (63%).

The most commonly reported impacts of these changes on livelihoods in Yaghnob were reduced crop yields (63% of respondents), reduced pasture availability (61% of respondents), and decreased water availability (55% of respondents). In villages near Tigrovaya Balka, 88% of respondents reported reduced crop yields, 68% reported decreased water availability, and 66% reported an increase in crop pests.

In response to these impacts, particularly reduced crop yields, respondents in both areas reported an increased dependency on markets for goods (39% in Yaghnob and 56% of respondents near Tigrovaya Balka) or that they have changed crop types to more drought-resistant varieties (26% and 41%,

respectively). In Yaghnob, 26% of respondents also reported selling their assets for additional income due to shortages resulting from reduced agricultural productivity. In villages near Tigrovaya Balka, 32% of respondents reported reduced agricultural productivity by using pesticides.

Changes in weather and climate were also reported to impact local biodiversity, namely species distribution and population. In both areas, respondents reported declines in wildlife species (47% in Yaghnob and 32% near Tigrovaya Balka) and shifts in wildlife ranges (45% and 24% of respondents). In Yaghnob, 32% of respondents reported reduced tree cover, while in villages near Tigrovaya Balka, 24% reported increased plant mortality due to excessive heat.

# Climate and human-wildlife interactions



## Argali (*Ovis ammon*)

<b>Common name:</b>	Argali
<b>Scientific name:</b>	<i>Ovis ammon</i>
<b>Geographic range:</b>	Tibet, Afghanistan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, Uzbekistan
<b>Population size in Tajikistan:</b>	29,121 (2024)
<b>Diet:</b>	Herbivore: grasses, herbs, sedges
<b>Habitat:</b>	Hilly and mountainous regions, with highly varying temperatures
<b>Characteristics:</b>	Largest wild sheep in the world; characteristic spiraling horns; important prey species for snow leopards & wolves
<b>IUCN Red List Status:</b>	Near Threatened
<b>Red Book of Tajikistan:</b>	Listed

### Main threats:

Argali occur in hilly lowland areas and high-elevation mountainous regions with highly variable seasonal temperatures. According to official data, Tajikistan's argali population has increased significantly, despite the threat of poaching and competition with livestock for forage.

The main threat to argali is poaching, which causes direct mortality and drives the argali into suboptimal habitats due to the associated human disturbance. The effects of climate change on poaching intensity are still poorly understood. As climate change is expected to impact the main livelihood of mountain communities (i.e., livestock keeping), economic instability may result in increased poaching pressure, especially since, as resources decline, habitats shrink, and livestock move seasonally to higher altitudes, people will increasingly come into proximity with argali.

Increasing livestock numbers and human encroachment on mountain pastures leads to increased competition for forage, reducing available habitat and causing habitat degradation. Climate change is expected to alter grazing patterns by extending their presence to higher altitudes and exacerbating competition with argali.

Linear infrastructure (e.g., roads, border fences, etc.) as well as industrial developments cause fragmentation of populations and habitats, leading to a loss of genetic diversity and an increased likelihood of local extinctions. Climate change is expected to change the movement patterns of argali. The development of new movement patterns may be increasingly constrained by infrastructure that lacks wildlife crossings, such as the existing border fence with China.

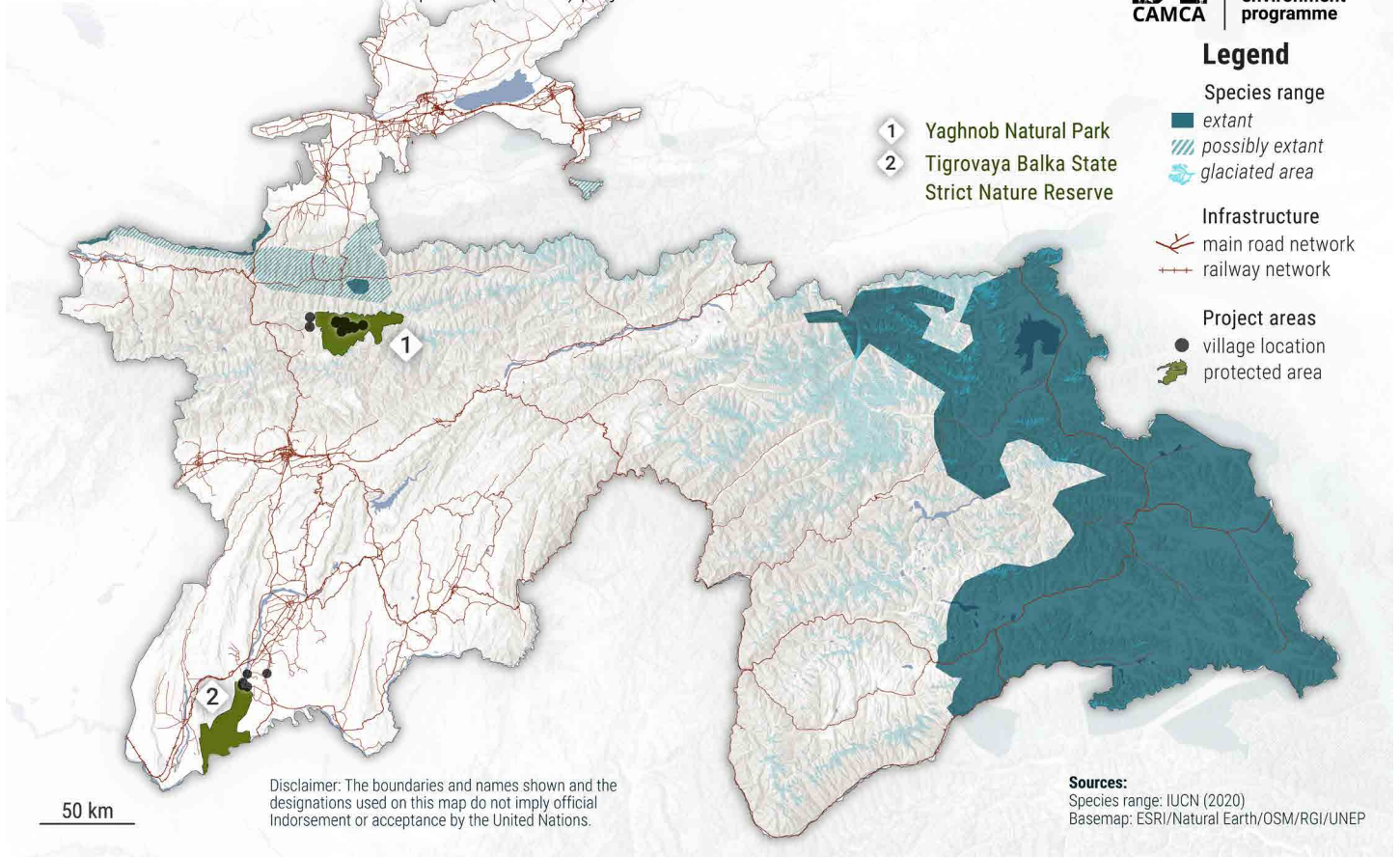
In the Pamirs, the collection of sub-shrubs for fuel (mainly teresken *Krascheninnikovia ceratoides*) leads to habitat degradation. This reduces available winter forage for argali and accelerates the desertification of high-mountain pastures already vulnerable to climate change, as the removal likely alters plant productivity and forage quality.

### Other threats:

- Livestock may be a vector for diseases, in particular Foot and Mouth Disease (FMD), Peste des Petits Ruminants (PPR) and sarcoptic mange. Rising temperatures are contributing to an increased disease prevalence among livestock. As livestock remain longer in high altitude pastures due to climate change, interactions with argali are likely to increase, leading to greater

## Argali sheep (*Ovis ammon*) range in Tajikistan

Central Asian Mammals and Climate Adaptation (CAMCA) project



competition-induced stress and forage shortages, which could, in turn, affect disease transmission.

- Climate change may affect the availability and quality of forage plants due to increased aridity and shifting phenology – that is, changes in the timing of key life events, such as when plants flower or produce seeds.

### Policy recommendations:

1. Improve enforcement of existing anti-poaching measures and enact additional measures to reduce poaching and associated disturbance via fines, patrolling, ranger training, and community-level enforcement.
2. Enact policies that support community-based conservancies or wildlife management areas to complement the system of commercial hunting concessions.
3. Enact sustainable land-use policies that promote human-argali coexistence, particularly

in the context of competition with livestock grazing. This may include:

- Integrating argali needs into pasture management plans, community development plans, and other land management frameworks, taking into account the forage and habitat needs of argali and other wild ungulates.
- Limiting the number of herding dogs and controlling their movements
- Regulating grazing to limit forage competition/disturbance and avoiding pasture degradation caused by out-of-season grazing.
- Stimulating alternative livelihoods that reduce grazing pressure, such as nature-based tourism and regulated hunting opportunities, based on clear rights and responsibilities for well-defined user groups, preferably local communities and land users.
- At the government level, assessing the potential for enhance incentive-based conservation through sustainable hunting in designated wildlife management areas, such as developing community-based initiatives,



allocating suitable areas and quotas, and earmarking a portion of hunting revenues for local development and social well-being.

3. Mainstream the conservation of argali and its habitat into linear infrastructure and industrial development planning, applying the mitigation hierarchy where necessary. This may include:

- Conducting a review to identify existing barriers to migration such as linear infrastructure (including border fences) and identifying measures to either remove barriers or make them more permeable.
- Carrying out a thorough assessment of all development activities (infrastructure, mining, tourism), prioritizing planning that avoids harm to argali populations and habitats, and mitigating any unavoidable negative impacts.
- Integrating wildlife migration into Environmental Impact Assessments for future infrastructure projects, including measures to avoid adverse impacts and mitigate any unavoidable negative impacts.

4. Improve funding and enhance technical assistance – including expert support and capacity building – for protected areas to improve monitoring, enforcement of

regulations, and antipoaching efforts, while specifically addressing argali conservation in protected area management plans.

5. Enable improved veterinary management of livestock via mandatory vaccinations, inspections, and other health measures to reduce risks of livestock-borne disease transmission.

6. Train and equip local veterinarians with the specialized skills and knowledge needed for the safe and effective handling of sick wild animals, as well as the proper collection and storage of samples for disease testing.

7. Enforce the legal ban on teresken collection and assist local people in identifying and using alternative energy sources, as well as increasing energy efficiency in their homes.

#### **International cooperation:**

The argali was listed on Appendix II of the Convention on Migratory Species (CMS) in 2011, indicating that its conservation and management require international agreements. It is one of the species covered by the Central Asian Mammals Initiative (CAMI) (Resolution 11.24 (Rev.COP13)). An Action Plan for the

Conservation of the Argali for 2024-2032 was adopted at its Range States meeting in Almaty, Kazakhstan in 2024.

Under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the subspecies of argali found in Tajikistan (*Ovis ammon polii* and *Ovis ammon severtzovi*) are listed as two separate species in Appendix II.

In the European Union (EU), argali are included in Annex B of the European Commission Wildlife Trade Regulations. (EC Reg. No 709/2010, amending EC Reg. No. 338/97).

In the United States of America, argali is listed as “Endangered” under the Endangered Species Act (ESA), but the population of Tajikistan (along with Mongolia and Kyrgyzstan) are listed as “Threatened”. This classification allows for the import of trophies from legally taken argali under limited and specifically authorized permits from the U.S. Fish and Wildlife Service (USFWS).





## Asiatic ibex (*Capra sibirica*)

<b>Common name:</b>	Asiatic ibex
<b>Scientific name:</b>	<i>Capra sibirica</i>
<b>Geographic range:</b>	Afghanistan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Uzbekistan
<b>Population size in Tajikistan:</b>	25,000–40,000 (2024)
<b>Diet:</b>	Herbivore: grasses, sedges, shrubs
<b>Habitat:</b>	High mountainous areas with rugged terrain and pockets of grazing areas
<b>Characteristics:</b>	One of the largest mountain goat species in the world; heavily built bodies with large horns that grow with age
<b>IUCN Red List Status:</b>	Near Threatened*
<b>Red Book of Tajikistan:</b>	Not Listed

\*It is possible that the estimated rate of population decline will approach the IUCN Red List threshold of 30% over three generations (set at 21 years), which would change the Red List status to 'Vulnerable'. However, the available data are of insufficient reliability and area coverage.

### Main threats:

Livestock grazing and the presence of herding dogs threaten the Asiatic ibex by causing habitat disturbance and competition for pasture and grazing resources with livestock. The impact of climate change on these threats varies. Asiatic ibex migrations, more vertical than horizontal, are mostly triggered by forage availability and temperature. In the summer, Asiatic ibex move to high elevation habitats, while in the fall, with the onset of snow, they migrate to lower areas and/or south-facing slopes. Given the expected changes in snow duration and higher temperatures, both Asiatic ibex and livestock are expected to move to higher altitudes, reducing available habitat, intensifying competition for grazing, and causing habitat disturbance.

Anthropogenic pressure such as poaching and poorly controlled legal hunting for meat and sport could contribute to population declines and even cause local extinctions. Hunting is allowed in Tajikistan through both a domestic hunting program and a foreign sport hunting program. The impacts of climate change on the intensity of poaching and uncontrolled hunting are currently unclear. However, as climate change is expected to negatively affect the primary livelihood of mountain communities (i.e., livestock keeping) economic instability may result in increased poaching pressure.

### Other threats:

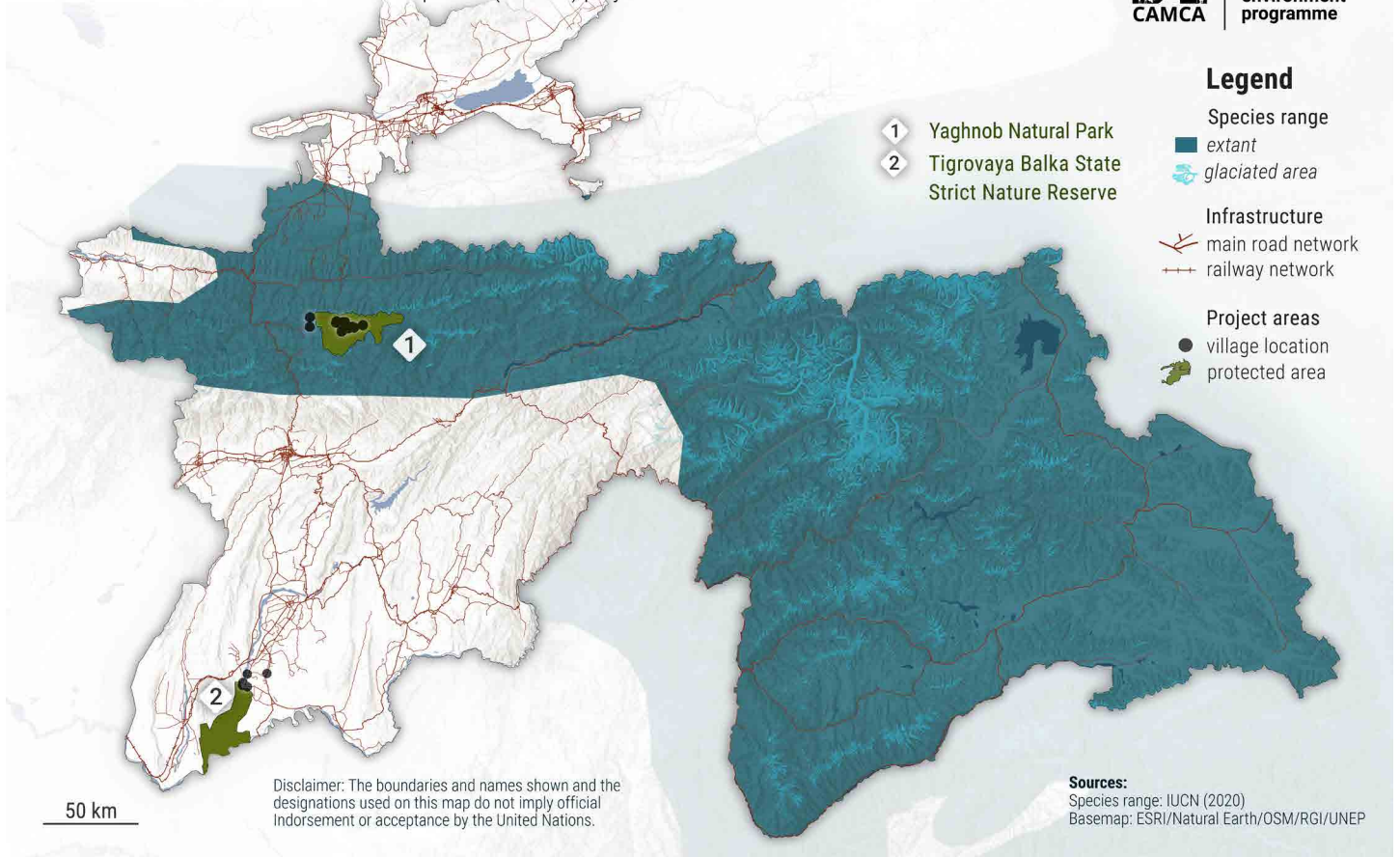
- Infectious diseases, such as pasteurellosis, pleuropneumonia, necrobacillosis, foot-and-mouth disease (FMD), and scabies (sarcoptic mange) may affect the species more as climate change leads to greater proximity with livestock, as well as the emergence of stressors that weaken the immune system of the Asiatic ibex.
- Climate change is likely to exacerbate desertification and habitat degradation by reducing the quantity and quality of forage plants (also driven by phenology shifts), as well as water availability, especially during summer. This could increase health stress for young animals and lactating females, potentially reducing recruitment.
- Mineral resource extraction and associated linear infrastructure, including power lines and roads, may disrupt existing or future migration routes, especially as climate change increases the need for Asiatic ibex to change movement patterns to access resources.

### Policy recommendations:

1. Reduce habitat disturbance and competition with livestock for Asiatic ibex by:
  - Increasing effective protection of areas that serve as natural refugia for Asiatic ibex and protecting rangelands and pastures used by the species.

## Asiatic ibex (*Capra sibirica*) range in Tajikistan

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- Improving grazing management by adjusting the number of livestock and grazing management approaches to reduce competition.
- Limiting the use of guard/herding dogs which may disturb or kill Asiatic ibex during the birthing season or kill other wildlife, such as marmots.
- Implement conservation incentives (e.g., nature-based tourism, optimized sustainable use for domestic hunting and hunting tourism, support in reducing human-wildlife conflict) that encourage voluntary measures to reduce pressures on Asiatic ibex and their habitat.

2. Enforce existing measures and enact additional measures to improve protection from poaching and associated disturbances via fines, patrolling, training for rangers, and community-level enforcement.

3. Remove or make permeable linear infrastructure (e.g., border fences) that impedes migration.

4. Research Asiatic ibex ecology, range shifts, changes in population size, changes in behavior, disease, and the correlation of any of these with changes in weather and climate.

5. Promote the conservation of core habitat, especially areas rich in glaciers. Investments are needed to establish and fund the operation of community-based conservation areas, national parks, and other wildlife conservation areas. An important aspect of Asiatic ibex conservation is the establishment and enforcement of grazing restrictions in protected areas that currently lack such measures.

### International cooperation:

The IUCN Red List categorizes the Asiatic ibex as Near Threatened with a decreasing population trend. CITES has listed the species under Appendix III for Pakistan, supporting cooperation between countries to prevent unsustainable or illegal exploitation.





## Bukhara deer (*Cervus hanglu bactrianus*)

<b>Common name:</b>	Bukhara deer
<b>Scientific name:</b>	<i>Cervus hanglu bactrianus</i>
<b>Geographic range:</b>	Afghanistan, Kazakhstan, Uzbekistan, Tajikistan, Turkmenistan
<b>Population size in Tajikistan:</b>	520–560 (2023) – stable (transboundary with Uzbekistan and Afghanistan); one large, well-protected population and several small introduced populations or populations with some relocated individuals
<b>Diet:</b>	Herbivore: grasses
<b>Habitat:</b>	Riparian lowlands with tugai forests and adjacent desert and agricultural areas
<b>Characteristics:</b>	Second largest member of the deer family, after the moose; important prey species for snow leopards, brown bears, and wolves
<b>IUCN Red List Status:</b>	Least Concern*
<b>Red Book of Tajikistan:</b>	Listed

\*The Bukhara deer was classified as “Vulnerable” in the IUCN Red Book in 1994, but it is currently listed under *Cervus hanglu*, which is classified as “Least Concern”. Applying the IUCN Red List criteria at the national level, Bukhara deer is Vulnerable in Tajikistan due to the low number of mature individuals (fewer than 1,000).

### Main threats:

Bukhara deer inhabit riparian lowlands with tugai forests, as well as adjacent desert and agricultural areas. Tugai forests provide protective cover and feeding habitats but are heavily dependent on water flow dynamics. Historically, the deer inhabited the entire river valleys of Amu Darya, Syr Darya, Murgab, Tedjen, Zarafshon, and Ile rivers. However, as only small fragments of tugai forests remain in these river belts, their range has been greatly restricted.

Most of the historical range no longer supports Bukhara deer due to the destruction and degradation of riparian habitats caused by:

- Land conversion for agricultural use;
- Anthropogenic changes to hydrology and regulation of water flow by upstream reservoirs managed for irrigation and/or electricity generation, resulting in reduced in inter-seasonal and inter-annual flow dynamics;
- The withdrawal of large quantities of river water for irrigation, lowering the groundwater table and increasing the aridity of riparian habitats and adjacent areas;
- Illegal logging in tugai forests, and
- Human-caused fires, often intentional.

In the small remaining habitat patches, protected deer populations may grow to

exceed the carrying capacity of their local habitat, potentially damaging forest resources through over-browsing. Given the relative fertility of the riparian forests compared to the surrounding landscape, tugai forests are also attractive for livestock grazing, adding to ongoing habitat degradation.

Climate change may cause heat stress for the species during the summer and the fall rut, affecting population growth rates. It could also further alter water availability and riparian dynamics, increasing drought and other stresses in tugai habitats and pasture areas. Habitat fragmentation limits the ability of populations to move between suitable areas in search of refuge, increasing their vulnerability.

### Other threats:

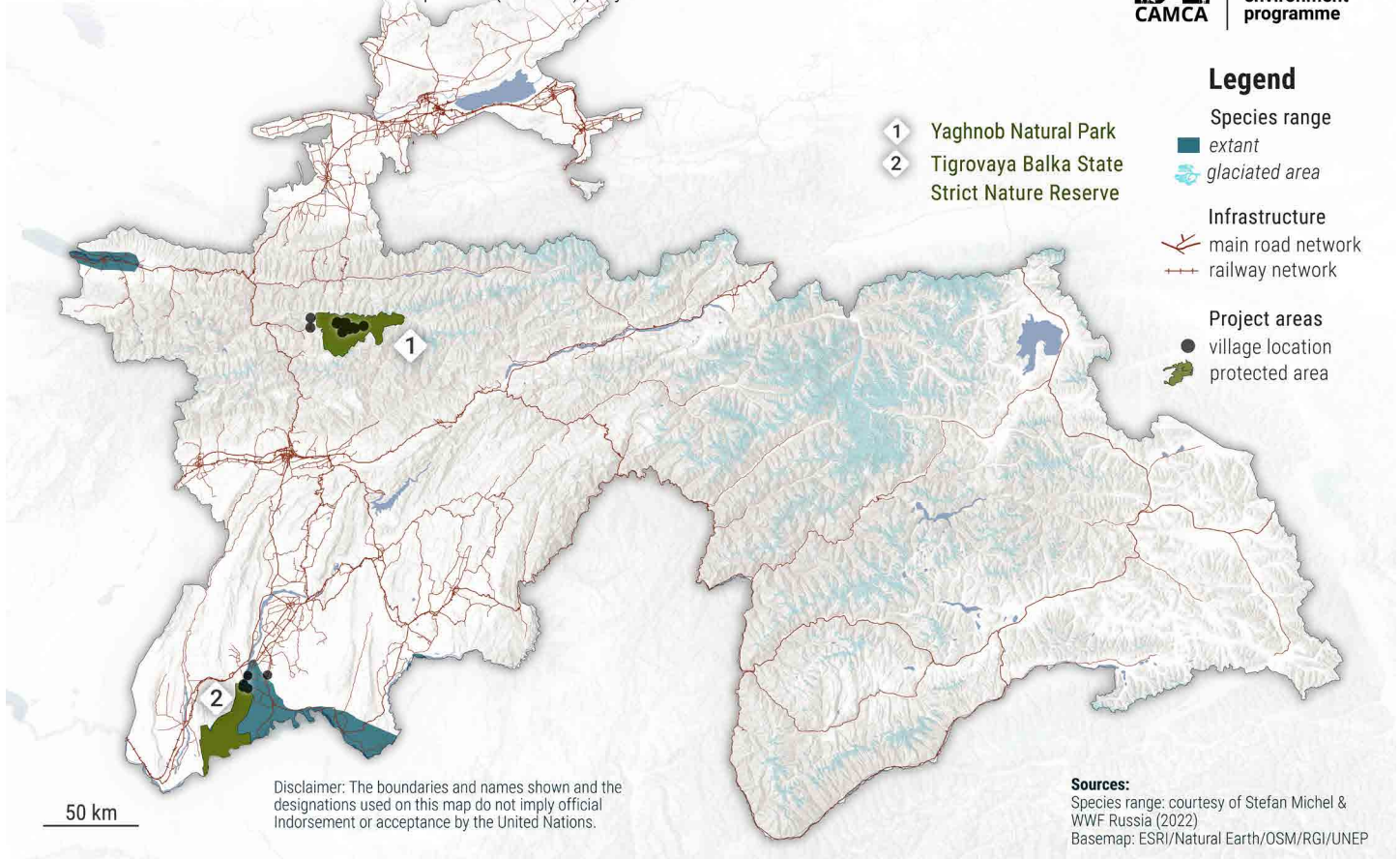
- Poaching: Bukhara deer are poached primarily for venison and possibly due to conflicts with farmers when the deer browse and damage crops. Climate change could exacerbate this conflict if communities face food shortages and economic instability.

### Policy recommendations:

1. The needs of Bukhara deer and the entire riparian tugai ecosystem need to be considered in legislation, development,

## Bukhara deer (*Cervus hanglu bactrianus*) range in Tajikistan

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community land management, landscape-level watershed management, and infrastructure planning that affect riparian areas. Potential activities include:

- Assessing the current and projected hydrological situation and riparian dynamics in Bukhara deer habitats, especially in the context of climate change
- Including preservation and maintenance of tugai forests and flow dynamics in protected areas management, landscape management, water resource management, and infrastructure development plans.
- Incorporating the needs of protected areas and tugai forest ecosystems into international water-use policies and agreements in their water management plans.
- Placing a moratorium on any extractive activities, agriculture, or land development in remaining riparian ecosystems, as well as improving awareness of the effects of fire.

2. Evaluate the possibility of incentive-based conservation through sustainable hunting in assigned wildlife management areas, create incentives to prevent poaching, and enable the coexistence of local communities and Bukhara deer outside of protected areas.

3. Enhance connectivity by:

- Ensuring that population and habitat connectivity is included in land management policies and accounted for in development and infrastructure plans.
- Evaluating opportunities for Bukhara deer to expand their range area within the river valleys of Zarafshan, Panj, and Vakhsh, as well as the potential for designating new protected areas, wildlife management areas, or movement corridors.
- Collaborating with Uzbekistan in the Zarafshon area and in the Amu Darya Valley on protection, management, and monitoring of transboundary populations of Bukhara deer.

**International cooperation:**

The Bukhara deer is listed as *Cervus elaphus yarkandensis* (populations in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and Afghanistan) in Appendix I and II of CMS, and is one of the species covered by the Central Asian Mammals Initiative (CAMI) (Resolution 11.24 (Rev.COP13)). Following an alarming population decline, when the overall population fell to as low as 350 individuals, Range States agreed on the [Memorandum of Understanding \(MOU\) concerning Conservation and Restoration of the Bukhara Deer](#) in 2002. A new Work Programme for the Bukhara deer (2025-2032) was adopted by the Signatory States in 2024.

In the European Union (EU), Bukhara deer is included in Annex B of the European Commission Wildlife Trade Regulations.

In the United States of America, the Endangered Species Act (ESA) lists Bactrian deer *Cervus elaphus bactrianus* as "Endangered".

Under CITES, Bukhara deer is listed as *Cervus elaphus bactrianus* in CITES Appendix II.





## Snow leopard (*Panthera uncia*)

<b>Common name:</b>	Snow leopard
<b>Scientific name:</b>	<i>Panthera uncia</i>
<b>Geographic range:</b>	Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, and Uzbekistan
<b>Population size in Tajikistan:</b>	approx. 500 (incl. shared individuals with Kyrgyzstan) (2024)
<b>Diet:</b>	Carnivore: mountain ungulates (argali, markhor, ibex), smaller mammals (marmots, hares), occasionally birds & livestock
<b>Habitat:</b>	Mountainous regions with rugged, steep terrain and rocky outcrops
<b>Characteristics:</b>	A keystone species that maintains the biological integrity of mountain ecosystems
<b>IUCN Red List Status:</b>	Vulnerable
<b>Red Book of Tajikistan:</b>	Listed

### Main threats:

The primary prey of snow leopards are wild ungulates, and poaching these species reduces food availability for the leopards. Increasing livestock numbers and poor pasture management degrade habitat and forage quality, further reducing wild prey availability. Both factors increase the risk of livestock predation, which may lead to retaliatory killings of snow leopards. Climate change has led to a spatial shift of ungulate habitat and livestock grazing patterns, resulting in changes to the distribution of snow leopard prey and increased competition between wild ungulates and livestock for pasture.

### Other threats:

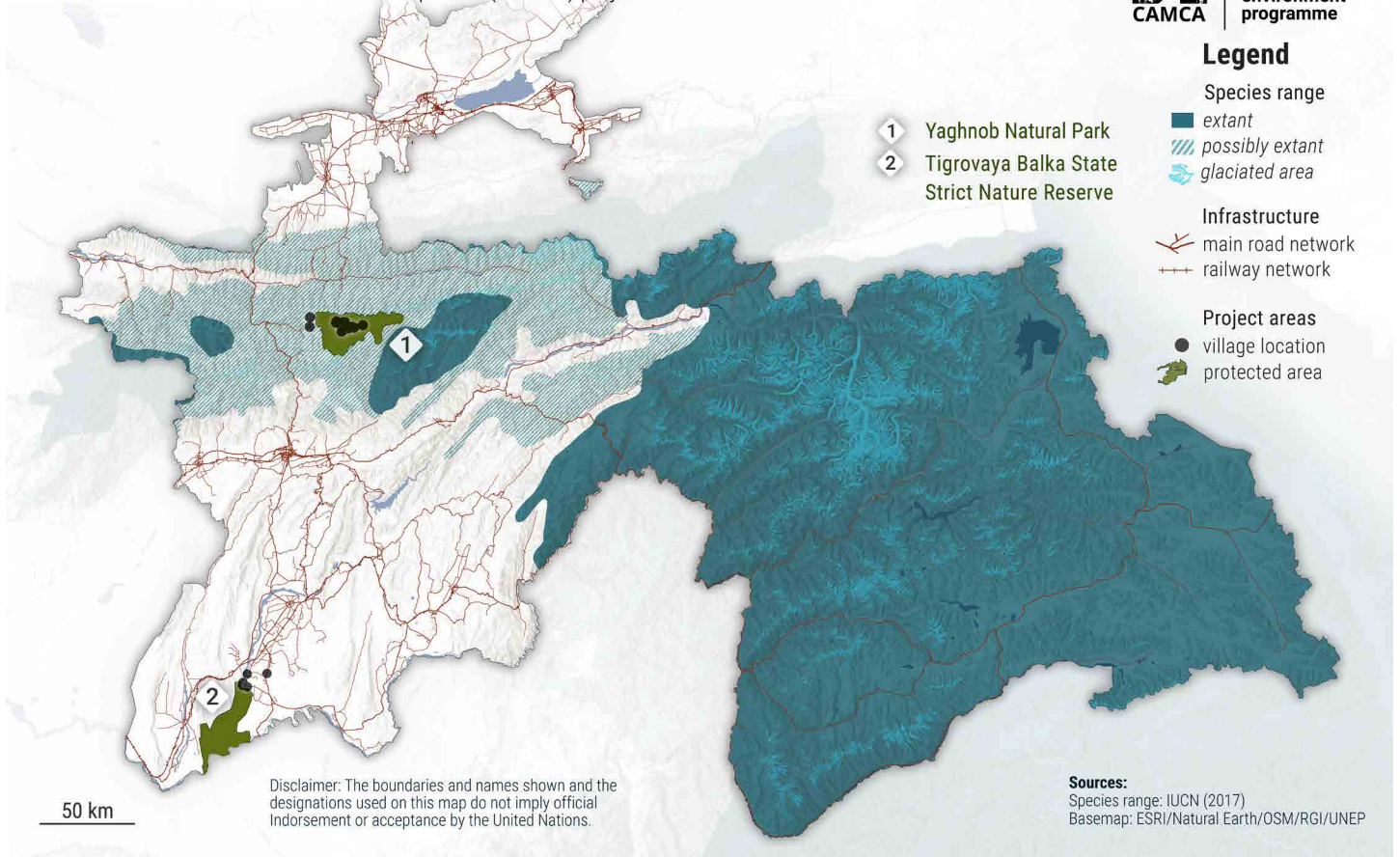
- Illegal killing, including poaching and intentional or incidental trapping of snow leopards for their skins and other parts. Climate change may exacerbate poaching by worsening the economic situation in mountain communities, leading to increased instances of individuals poaching of snow leopards for illegal wildlife trade.
- Mineral resource extraction, energy development, and associated linear infrastructure, including power lines and roads, may disrupt existing or future migration routes. As climate change forces snow leopards and prey species to alter their movement patterns to access resources, these disruptions may intensify. National security infrastructure, such as border fences, also contributes to habitat fragmentation.

- Livestock may act as disease vectors, affecting the health of snow leopard prey species. In particular, livestock could contribute to the transmission of Foot and Mouth Disease, Peste des petits ruminants (PPR), and sarcoptic mange, which may also affect snow leopards. The proximity of herding dogs to snow leopards may pose a risk for the transmission of canine distemper virus and rabies. Climate change may increase disease transmission as the proximity between snow leopards, their wild prey, and livestock also increases, potentially leading to the emergence of new diseases.

### Policy recommendations:

1. Promote the coexistence of snow leopards with human land-use, especially for livestock. Coexistence can be stimulated by:
  - Improving the implementation of pasture management and land use planning by regulating grazing times and locations to limit competition with livestock and avoid pasture degradation; by ensuring that livestock numbers align with carrying capacity, taking into account the forage needs of argali and other wild ungulates that serve as snow leopard prey.
  - Regulating the number and movements of herding dogs,
  - Encouraging nature-friendly alternative livelihoods that enable communities to become less dependent on livestock and to reduce livestock numbers.

**Snow leopard (*Panthera uncia*) range in Tajikistan**  
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- Reducing the risk of retaliatory killings through predator-proof corrals, insurance and incentive schemes, revolving community funds, and other community benefits.
- Enacting veterinary surveillance and vaccination of both livestock and dogs in and close to habitats of the snow leopards and their prey.

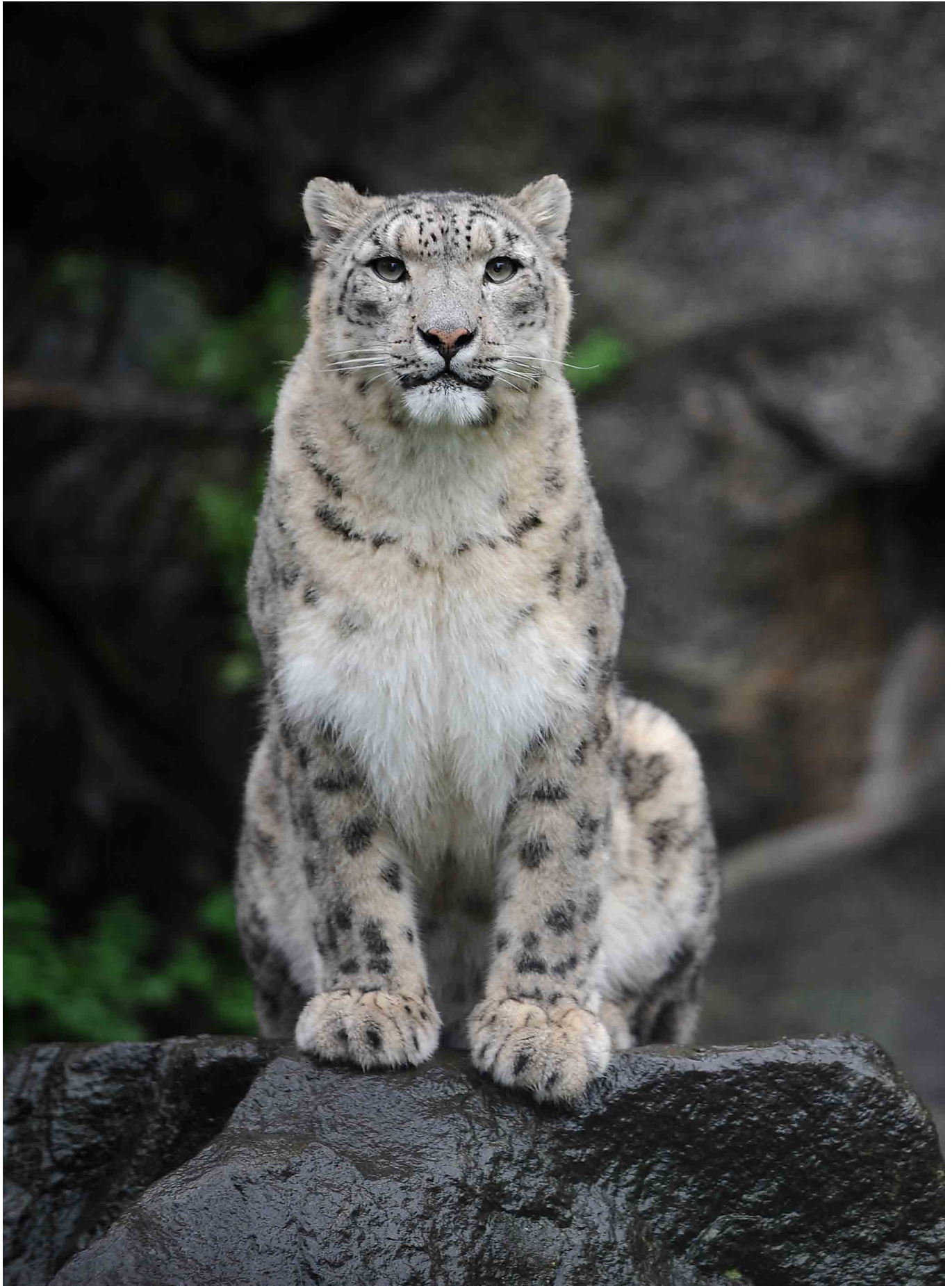
2. Enforce existing measures and enact additional ones to improve protection from poaching and the illegal wildlife trade. This can be achieved by enhancing legislation, intensifying law enforcement, improving prosecution, addressing drivers, and improving data collection, analysis, and information sharing, in compliance and cooperation with CITES. Examples include:

- Mitigating the effects of poaching and associated disturbances by supporting effective law enforcement against poaching and illegal trade, including training for officers, border staff, and community members.
- Establishing partnerships across different ministries (such as Security and Customs)

to track and combat the illegal trade of snow leopards and their parts.

3. Actions to reduce habitat fragmentation include:

- Removing or making permeable linear infrastructure (e.g., border fences) that impedes movement.
- Taking stock of animal movement routes and delineating ecological corridors that connect core protected areas in snow leopard habitats.
- Mandating infrastructure projects to include wildlife movements and other wildlife needs—especially regarding Red-listed and Red Book-listed species—in their Environmental Impact Assessments, avoiding adverse impacts and mitigating any unavoidable negative impacts.
- Strengthening transboundary collaboration with China, Kyrgyzstan, Afghanistan, and Uzbekistan to facilitate snow leopard movement and ecosystem connectivity, improving protection, and coordinating species monitoring.





- Completing a thorough assessment of all development activities (infrastructure, mining, tourism), prioritizing planning that avoids harm to snow leopard populations and habitats and mitigates unavoidable negative impacts.

In general, protected areas with snow leopards require additional assistance to effectively include this species in management plans. This includes increased funding and technical assistance, particularly for staff, equipment, training, and patrol vehicles. Community-based conservation areas and conservation-minded private hunting concessions could also be supported.

### **International cooperation:**

Snow leopards are listed as *Uncia uncia* in Appendix I of CMS, and are one of the species covered by the Central Asian Mammals Initiative (CAMI) (Resolution 11.24 (Rev. COP13)). They are also covered by the CMS [Recommendation 9.3. Tigers and Other Asian Big Cats](#) that calls on range states to enhance mutual transboundary cooperation for the

conservation and management of Asian big cat species.

CMS activities for snow leopards and argali living in similar mountain ecosystems must align with conservation efforts under the [Global Snow Leopard and Ecosystem Protection Program \(GSLEP\)](#). GSLEP provides a common framework for the cooperation among snow leopard Range States, non-governmental organizations, inter-governmental organizations, local communities, and the private sector. The program seeks to ensure the long-term survival of the snow leopard in its natural ecosystem by promoting landscape-level transboundary conservation.

In the European Union (EU), the snow leopard is included in Annex A of the European Commission Wildlife Trade Regulations (Reg. (EU) 2023/966 of 15 May 2023).

Under CITES, the snow leopard is listed as *Panthera uncia* under Appendix I, which covers endangered species for which all international trade is prohibited.



## Tien Shan brown bear (*Ursus arctos isabellinus*)

<b>Common name:</b>	Tien Shan brown bear
<b>Scientific name:</b>	<i>Ursus arctos isabellinus</i>
<b>Geographic range:</b>	Kazakhstan, Kyrgyzstan, Tajikistan
<b>Population size in Tajikistan:</b>	550–600 (2024)
<b>Diet:</b>	Omnivore: grasses, herbs, roots, berries, nuts, as well as animals such as insects, mammals, fish (when available)
<b>Habitat:</b>	Mountain highlands from the zone of temperate forests up to the subalpine belt
<b>Characteristics:</b>	Subspecies of the brown bear, found in North America, Europe, and Asia
<b>IUCN Red List Status:</b>	<i>Ursus arctos</i> – Least Concern <i>U. a. isabellinus</i> – Vulnerable, with one population listed as Endangered
<b>Red Book of Tajikistan:</b>	Listed

### Main threats:

The main threat to the Tien Shan brown bear is human-wildlife conflict.

- Attraction to semi-wild orchards and other wild fruit and walnut trees causes conflict between bears and farmers that both use these resources. Bears are sometimes seen as competitors and pests.
- Conflict with beekeepers is also reported, as bears occasionally raid beehives. Beekeepers, especially those living in remote areas, tend to persecute bears with the help of local poachers.
- Occasional encounters with people collecting wild-growing plants or with livestock herders cause dangerous situations for both humans and bears.
- The Government of Tajikistan issues permits to kill bears that threaten people and their assets. An annual quota of up to ten bears is set for this purpose.
- Direct persecution by humans is a key threat responsible for the decline of bears in some parts of Tajikistan.

Bears, due to their ecology, are highly adaptive to climate change and do not show high sensitivity towards current climate trends. However, climate change may affect them indirectly through spatio-temporal changes in food availability. For example, colder temperatures, dwindling food sources, and shorter days are cues for bears to start winter

hibernation. Climate change may cause a later onset and earlier end of hibernation, changing bear energy requirements and foraging patterns. Both factors can increase the risk of conflict with humans and retaliatory killings.

### Other threats:

- Poaching is a significant threat, as bears and their parts, such as fat and gall bladders, are sought after for food and traditional medicine. Bears are also targeted for recreational hunting and the pet trade. Poaching may increase as climate change causes economic instability in local communities.
- Bears occasionally prey on livestock, due in part to poor livestock management practices and a lack of measures to prevent conflict. Climate change might exacerbate this conflict as natural food resources dwindle.

### Policy recommendations:

1. Human-wildlife conflict reduction can be achieved by implementing measures that have proven successful in deterring conflict. These include:

- electric fencing around beehives and orchards
- use of livestock guard dogs
- visual and audio devices (such as fox lights and transmitters that emit loud noises) to scare bears away
- bear-proof garbage bins to avoid bear habituation to humans
- education and awareness raising campaigns

## Tian Shan brown bear (*Ursus arctos isabellinus*) range in Tajikistan

Central Asian Mammals and Climate Adaptation (CAMCA) project



### Legend

Species range

- extant
- possibly extant
- glaciated area

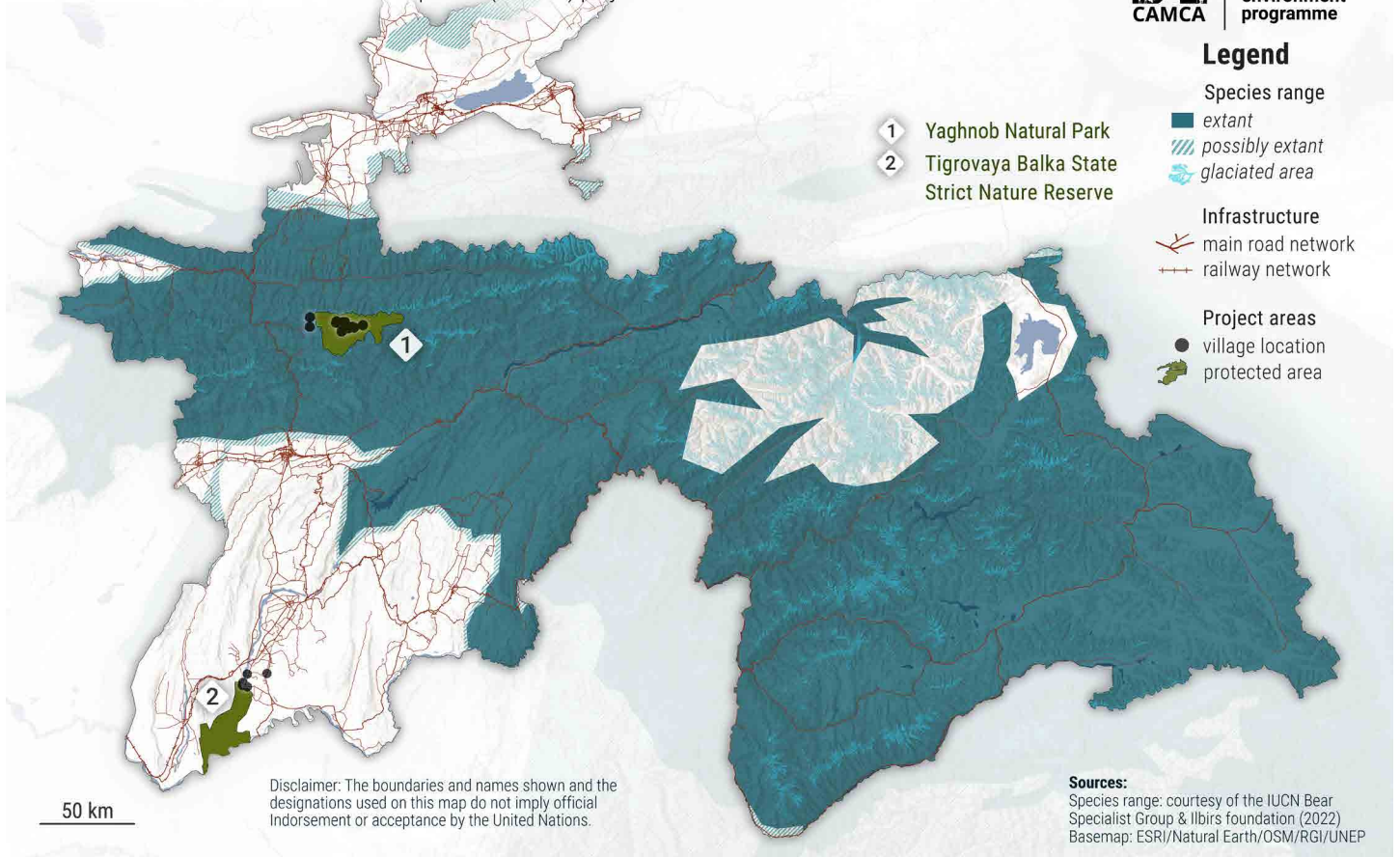
Infrastructure

- main road network
- railway network

Project areas

- village location
- protected area

- 1 Yaghnob Natural Park
- 2 Tigrovaya Balka State Strict Nature Reserve



- to promote appropriate and safe behavior when encountering bears
  - practices to keep tourist areas clean and food-free to deter future human-bear encounters.
2. Strengthen policies to protect and increase resilience of bears, their habitat, and their food sources.
- Conservation incentives (such as nature tourism, sustainable use, reducing human-wildlife conflict) to encourage voluntary measures that reduce pressures on bears and their habitat.
  - Expand existing reserves and national parks and create new protected areas and ecological corridors.
  - Improve funding and material assistance to protected areas including capacity building for protected area staff, equipment, training, and patrol vehicles.

- Include specific bear management measures in protected area management plans.
  - Mandate infrastructure projects include wildlife movements and other needs in their Environmental Impact Assessments, prioritizing avoidance of adverse impacts and mitigating unavoidable negative impacts.
  - Consult with governments and management in other countries (for example, Croatia, Slovenia, Romania) with experience in managing bear conflicts to determine the best course of action for Tajikistan.
3. Enforce existing measures and enact additional measures that support effective law enforcement against poaching and illegal trade, including training for law enforcement officers and border staff.
4. Research population ecology and the level

of community acceptance of bears, as the Tien Shan brown bear appears understudied.

5. Conduct environmental awareness campaigns focused on the importance of bears.

6. Promote planting native wild fruit trees in forest areas to increase natural food supplies for bears.

**International cooperation:**

The Tien Shan brown bear is included in CITES Appendix I as *Ursus arctos isabellinus*.



# Existing national legislation

- Law No. 761 “Forest Code”  
<https://www.fao.org/faolex/results/details/en/c/LEX-FAOC181164>
- Law of the Republic of Tajikistan “On Nature Protection” (February 1, 1996 #223, May 10, 2002 #30, December 2, 2002 #75, July 15, 2004 #58, June 13, 2007, #284)  
<https://faolex.fao.org/docs/pdf/taj42462E.pdf>
- Law of the Republic of Tajikistan “On the protection and use of wildlife” (1997)
- Law of the Republic of Tajikistan “On Specially Protected Natural Areas” (2011)
- Law of the Republic of Tajikistan “On Environmental Education of the Population” (2010)
- Law of the Republic of Tajikistan №760 “On Environmental Protection” (2011)  
<https://policy.asiapacificenergy.org/ru/node/413>
- Law No. 1618 “On pastoralism”  
<https://www.ecolex.org/details/legislation/law-no-1618-on-pastoralism-lex-faac188331/>
- Law of the Republic of Tajikistan No. 1003 “On mountain regions of the Republic of Tajikistan” (2013)  
<https://cis-legislation.com/document.fwx?rgn=61948>
- Law of the Republic of Tajikistan No. 354 “On Fauna” (2008)  
<https://cis-legislation.com/document.fwx?rgn=21055>
- Law of the Republic of Tajikistan “On the protection and use of wildlife” (1994)
- Concept of environmental protection in the Republic of Tajikistan No. 645 (2008)  
<https://cis-legislation.com/document.fwx?rgn=26345>
- Law of the Republic of Tajikistan dated March 19, 2013 No. 951 On pastures  
<https://www.ecolex.org/details/legislation/law-no-951-on-pastures-lex-faac170865/>
- Law No. 1118 “On hunting and hunting management”.  
<https://www.fao.org/faolex/results/details/fr/c/LEX-FAOC170864/#:~:text=This%20Law%20sets%20forth%20legal%20and%20economic,social%20relations%20concerning%20rational%20management%20and%20sustainable>

GRID-Arendal, 2025, *Addressing the impacts of climate change on mountain wildlife and communities – Tajikistan*, Central Asian Mammals and Climate Adaptation project, UN Environment Programme.





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the German Bundestag