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POTENTIAL FOR COMMUNITY-BASED WILDLIFE MANAGEMENT IN CENTRAL ASIA

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Potential for Community-based Wildlife Management in Central Asia

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COVER IMAGES

From left to right: Saiga Antelope, Chyornye Zemli Nature Reserve, Kalmykia region, Russia © DNK_KolyaN/ Getty Images; Yurt in grassland in Xinjiang, China © Wenbin/Getty Images; Wildlife photographer © Volodymyr Burdiak; Argali Sheep © Narangerel Naranpurev

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Executive summary

Rationale of this study

Community-based wildlife management (CBWM) – also referred to as Community-Based Natural Resources Management describes the management of wild living resources – including terrestrial and aquatic wildlife, their habitats and related resources – by collective, local institutions for local benefit. A variety of other terms are used throughout literature to describe the same concept. The main objective of CBWM is to create, through a bottom-up, participatory approach, conditions allowing local people to benefit from a sustainable management and utilization of wildlife and its habitat. The approach intends to change people's behaviours and attitudes and in doing so to achieve defined conservation goals.

Implementation of CBWM usually means granting the right to manage selected species of wildlife in a certain area to local communities, and this often includes land use rights. Thereby communities can take management decisions regarding extractive and non-extractive uses of wildlife and their habitat and about spending possible resulting revenues, e.g. on social projects. Significant conservation benefits can be achieved through such practices, provided that certain pre-conditions are met. Empowering local people to sustainably manage wildlife populations so that they become an asset to their livelihoods has contributed to a reduction of poaching and better conservation of the managed species, as documented in case studies from around the world.

To date only a few examples of CBWM exist in Central Asia. The goal of this study is to assess the potential for applying CBWM for improving the conservation of selected species of mammals listed on the Appendices of the Convention on the Conservation of Migratory Species of Wild Animals (CMS), in Central Asian countries of Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan. . Parties to CMS, and Range States of the CMS' Central Asian Mammals Initiative (CAMI), including the target countries of this study, adopted the Programme of Work for the initiative for 2021-2026 (CAMI POW), which includes several activities aiming at promoting implementation of CBWM in the Central Asian region. For this purpose, four species covered under CAMI have been selected and options for CBWM approaches evaluated in terms of their feasibility. Sustainable extractive use is discussed only for species, listed on CMS Appendix II. Finally, policy recommendations to support the successful application of CBWM approaches by national Governments and other stakeholders in the region are provided.

Historical wildlife management in Central Asia

Indigenous peoples of Central Asia have historically been living with and managing wildlife. Archaeological evidence, petroglyphs and remnants of ancient hunting structures found in the region suggest that people have hunted wildlife since the Stone Age. Beyond hunting for subsistence, wildlife has had a cultural and spiritual value (see Section 1.1.1). Indirect evidence of centuries of co-existence between people and substantial wildlife populations as well as folklore of native peoples of Central Asia indicate that traditions and informal rules existed, which contributed to the sustainability of hunting. Hunting intensified during the 18th and 19th centuries, when trade in wildlife products between Europe, Central Asia and China expanded due to an increased influence of the Russian Empire in the region. Hunting larger numbers of animals

by groups of local or foreign hunters for commercial purposes became more common, finally leading to population declines of several wildlife species (see Section 1.1.2).

In the Soviet period, formal legislation and institutional structures for wildlife conservation and management were established in Central Asian countries (Section 1.1.3). First, protected areas were gazetted and lists of endangered species were put together in so-called Red Books. A Red Book listing was automatically linked to a legal prohibition of harvesting such species of plants or animals. A centralized and state-controlled hunting management was introduced with little local participation. It included an area-based management approach and measures like population counts, hunting bans, restrictions for the ownership of weapons, closed borders to control trade and law enforcement.

This wildlife management system provided conditions for the recovery of some species, while, at the same time, caused declines of others, which were perceived as harmful, or which were overharvested by state institutions. For example, populations of Saiga Antelopes showed significant growth towards the middle of the 20th century, allowing large-scale commercial hunting of the species of several thousand individuals annually. For other species like Goitered Gazelle and wild sheep commercial harvest through state institutions or poaching levels may have been relatively high, as populations had decreased during that period. Some carnivores, such as wolves and tigers were perceived as harmful species and were therefore not protected or were even purposefully culled, which led to their declines and local extinctions. Most importantly, decades of centralized governance have marginalized the involvement of local people in managing wildlife and other natural resources (see Section 1.2).

The collapse of the Soviet Union and the resulting economic and governance crisis prevented or significantly limited enforcement of any wildlife protection or management measures for several years or even a decade, depending on the country (Section 1.1.4). In combination with economic problems and civil conflicts in some parts of Central Asia this enforcement gap gave rise to widespread poaching. As the Central Asian Governments increasingly succeeded to overcome these crises, new wildlife protection and management systems were put in place, which built on the system developed during the Soviet period.

The wildlife protection and management mechanisms developed during the Soviet period are still reflected in the legislation of the Central Asian states (see 1.1.3, 1.1.4 for history and 3.4.2 for current legislation). The basic elements of the legislation on protected areas mostly stayed the same. Endangered or rare species of fauna and flora are also still listed in Red Books to enhance their protection. In addition, some countries introduced moratoria on hunting for non-listed species, as it had been the case for the Saiga Antelope in Kazakhstan for many years as well as in some regions of Kyrgyzstan, where hunting any wildlife is temporarily prohibited.

An area-based system is used to manage huntable wildlife in many Central Asian countries (3.4.2). Hunting areas are assigned to a private entity, which has the right to use wildlife, but also the obligation to monitor and protect it. Currently, mostly commercial entities manage wildlife in hunting areas without much involvement of local people throughout the region. For example, in the context of international trophy hunting tourism for highly valued species like Marco Polo Sheep and Markhor, most hunting areas are managed by people with commercial interests, who come from cities outside of the wildlife habitat. Only some hunting areas have been also assigned to enterprises founded by local families or non-commercial local organizations. The frequent

exclusion of local people is thought to have significantly contributed to overhunting and a decline of wildlife populations.

However, models with a greater involvement of local communities are being considered and have already been trialed in the region. Examples of applying CBWM exist in Tajikistan for Argali, in Kazakhstan for Saiga and in Kyrgyzstan, where community-based organizations have managed hunting or developed touristic activities including wildlife watching opportunities. These first attempts to develop CBWM initiatives in the region achieved some benefits for conservation and local development but also encountered challenges.

Focal species and geographical scope of this study

This study focuses on wildlife management in Tajikistan, Kyrgyzstan, Uzbekistan, Kazakhstan and, in parts, Mongolia. Four species covered by CAMI were selected for this study to be evaluated with respect to the potential and relevance of using CBWM approaches for their conservation and management (Section 2.1). Selection criteria included: the amount of available knowledge and data about the species, the potential for its management by local communities, existing CBWM approaches, relevance for the region based on the size of the distribution range of the species in the region, and the need for action to improve the species' conservation and management. Saiga Antelope, Argali Sheep, Snow Leopard and Bukhara Deer have been selected.

The Saiga Antelope (*Saiga sp*.) is an ungulate species, roaming the steppes, semi-deserts and deserts of Central Asia (see 2.2.1 for more detail). It has recently been downlisted from Critically Endangered to Near Threatened on the IUCN Red List due to improvements in its conservation status. The main threats are poaching, disease outbreaks, habitat loss and fragmentation (for instance, through infrastructure developments), and competition with livestock. Particularly, populations of the nominate species *Saiga tatarica tatarica* in Kazakhstan have shown persistent growth in recent years after an all-time low around the year 2000 and significant mass die-offs in two populations in 2010 and 2015. A moratorium on hunting Saiga has been in place in Kazakhstan until 2023 and has not been renewed since. Trade in Saiga products is currently banned in all Range States through national legislation. In Russia, Mongolia and Uzbekistan Saiga is also listed in national Red Books, meaning that it cannot be hunted in these countries. Saiga is listed on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES; with "a zero export quota for wild specimens traded for commercial purposes") and Appendix II of CMS.

The Argali (*Ovis ammon*) is the largest species of wild sheep, which is listed in the IUCN Red List as Near Threatened at the species level (see 2.2.2 for more detail). It has nine subspecies with a varying conservation status, of which eight inhabit the target countries of this study. Main threats include poaching and competition with livestock. As systematic population surveys are lacking, in most target countries the description of the current situation of the species is based on expert estimates. According to the IUCN Red List, estimates suggest a stable population size or even a positive trend locally, but a decline on a larger scale. Hunting is banned in all Range States, but exceptional hunts are possible in several countries. Argali are a highly attractive huntable species and valued by hunters from abroad. Argali trophies from Central Asia can be brought to other countries with the required permits. The species is listed in Appendix II of CITES as well as Appendix II of CMS.

The Snow Leopard is the only predator considered in this study and it is classified as Vulnerable in the IUCN Red list (Section 2.2.3). Its populations in target countries are small, ranging from an estimated 1,730 to 1,920 individuals in total. Uncertainties in population estimates make

establishing a trend difficult, but it is currently regarded as stable or slightly positive in many areas, while decreasing in some other parts of its global range according to the IUCN Red List. The main threats for the species are a lack of wild prey, habitat degradation, poaching, retaliatory killings as response to depredation by Snow Leopards on livestock, and illegal trade. Wild ungulates, which serve as natural prey of snow leopards are threatened primarily by competition with livestock for pasture and poaching. Snow Leopards are legally protected throughout their range and listed in Appendix I of CMS and likewise Appendix I of CITES.

The Bukhara Deer is regarded as a subspecies of the Tarim Red Deer, which is assessed as Least Concern by the IUCN Red List at the species level with a growing population (Section 2.2.4). There are less than 4000 Bukhara Deer left in the wild with an increasing trend. Its occurrence is restricted to riparian woodlands in Afghanistan, Kazakhstan, Tajikistan, Turkmenistan and Uzbekistan. A high degree of fragmentation and loss of suitable habitat, disturbance by human activities and poaching are the main threats for Bukhara Deer. All Range States legally protect Bukhara Deer, and it is listed on both Appendices I and II of CMS and on Appendix II of CITES.

Poaching is a significant threat to all focal species, and its current and historical effects on their populations are discussed in Sections 2.3. In addition to strengthening existing law enforcement, the involvement of local people in CBWM approaches has the potential to decrease the level of poaching as well as other threats to the survival of the species.

Community-based wildlife management in international policy

Although people have traditionally managed the natural environment they live in, including wildlife, from a conservation perspective CBWM has received increasing attention since the 1980s. In terms of international policy, CBWM approaches are anchored both in human rights policy and in biodiversity conservation policy (see Section 3.2). The UN General Assembly Declarations on the Rights of Indigenous Peoples and on the Rights of Peasants and Other People Working in Rural Areas stress the importance of community rights.

Lessons learned from implementing CBWM show that it can be an effective approach to combat illegal wildlife trade and to ensure sustainability of natural resource use (Section 3.1). This is reflected in the Kunming-Montreal Global Biodiversity Framework (KMGBF), several CITES Decisions and particularly in Resolution Conf. 16.6 (Rev. CoP18) on CITES and Livelihoods. The success of CBWM depends on several factors, including the existence of an enabling policy framework to empower local people. The renewed emphasis on IPLC rights – particularly in the KMGBF – provides hope that CBWM will be increasingly implemented by policy-makers and practitioners worldwide.

Examples of implementation of CBWM worldwide

Many successful examples of CBWM exist globally, elements of which have the potential to be applicable also for focal species of this study. This study presents four of them (see Section 3.3 for details):

1) An association of ex-hunters in Colombia became engaged in monitoring and conservation of the American Crocodile and managed to bring the population back to levels, which allow the sale of crocodile skins.

2) Community conservancies in Namibia have the right to decide about land use and wildlife use on communal lands, gain income mainly from tourism and trophy hunting besides agriculture, which has led to the recovery of several populations of managed wildlife.

3) Local communities in Peru are allowed to capture and shear wild vicuña and sell its wool, which brings extra income to local communities and has made a recovery of the vicuña population possible.

4) In Kalimantan, Indonesia, Conservation Cooperatives manage natural resources and are involved in monitoring and enforcement, contributing to the conservation of wildlife, and provide, in turn, financial support to community members.

Most importantly, lessons from implementing CBWM worldwide show that local communities can be instrumental in ensuring sustainability of wildlife use and contribute significantly to the conservation of threatened species. To achieve this, local communities must be empowered to make their own decisions about the way of sustainable natural resource use and the level of usage, must have control over benefits arising from this use, or at least be involved in management decisions. In practice, this is usually achieved with some level of co-management with state institutions. Another important precondition for success is that benefits from wildlife protection must outweigh the related costs and thereby be economically more attractive than illegal wildlife use.

Challenges and opportunities for CBWM in the legislation of Central Asian Countries

Due to the common history of Central Asian countries having been part of the Soviet Union, their legislations have many similarities (see Section 3.4.2). Endangered species are protected through listing them in Red Books, which prohibits any hunting. But irregular reviews and a lack of standard procedures limit the efficacy of such listings for wildlife conservation. The conservation of nature and wildlife is generally enacted through designating the most threatened or valuable ecosystems as protected areas. The level of restrictions of human activities in protected areas ranges from no human activities in strictly protected areas to regulated land use and tourism being possible in several other categories. Hunting is normally possible outside protected areas and is managed in an area-based approach.

Generally, CBWM is not explicitly foreseen in the legislation of Central Asian countries and not propagated as a solution for wildlife management by state agencies. However, some opportunities for developing CBWM with non-extractive use (wildlife-based tourism) and extractive use (hunting) exist and are already compatible with the current legislation.

Non-extractive use currently generates little revenues, because the target countries are not yet well known as wildlife watching destinations or there are other reasons. In most Central Asian

countries protected areas are managed only by state institutions without formal involvement of local communities. However, communities in the vicinity of the protected areas might benefit from providing services to tourists who are visiting protected areas. In Kyrgyzstan, additionally the national legislation allows local communities to establish small, protected areas (micro-reserves) themselves and to manage touristic use of these areas. This has been successfully practiced in a few places in the country, which are easier to access from the capital city than others.

A protected area category common to all Central Asian States, covering much larger areas than the strictly enforced protected areas and particularly relevant for wildlife is the zakaznik (nature sanctuary). The purpose of a zakaznik is to temporarily restrict human activities for the protection of one or several species of plants or animals. However, most such areas have turned into permanently protected areas, while the enforcement of restrictions is currently not fully feasible, leading to the degradation of wildlife habitats and poaching in zakazniks. An alternative approach to managing such areas can be CBWM, which would strengthen the engagement of local communities and thereby improve the sustainability of resource use.

Outside of protected areas wildlife-watching is mostly unregulated apart from general behavioral principles for interactions with wildlife. Local communities can, in theory, develop own touristic offers including wildlife watching. However, the potential of developing CBWM with non-extractive use in the form of tourism is currently limited by several factors, such as lacking touristic infrastructure in wildlife habitat, remoteness of wildlife habitat, limited capacity of local communities and limited knowledge about the potential for wildlife watching tourism among operators and consumers. Therefore, upfront investment is usually needed in order to develop such offers for tourists.

Concerning extractive use, the area-based wildlife management systems which are in place today can provide some opportunities for local community involvement. Where hunting wildlife is possible, wildlife management areas are delineated, and their management is assigned to a legal entity. This can be a company, a private person, or even an NGO, with the latter being a way for local communities to get control of the wildlife in their area. The managing entity has the obligation to develop a management plan for the area and to employ rangers to protect wildlife from poaching, among others. This system has been used to set up several organizations practicing community-based hunting tourism in the region with positive effects for the conservation of the hunted species.

However, there are several legal obstacles for applying CBWM in this system. For example, the managers of such wildlife areas are not formally authorized to manage land use and thus to ensure that any land use in the area is not harmful for wildlife. Furthermore, it is possible to manage such a wildlife area without conducting any hunts, if desired and agreed with the responsible agency. The area can be used for tourism only or in addition to some hunting, for example. However, despite bearing the costs of management, the managing entity has no exclusive rights for touristic use of the area, which can also be visited by third parties free of charge.

In conclusion, although some opportunities for the development of CBWM already exist in the current legislation and the first CBWM initiatives have taken advantage of these, modifications

are necessary to enable more local communities to benefit from wildlife and ensure its conservation (see Section 3.4.1 and 3.4.2 for details).

Examples of community-based wildlife management from Central Asia

Despite the challenges described above, several examples of both non-extractive and extractive wildlife use by communities exist in Central Asian countries (Sections 3.4.3-3.4.5). In both Tajikistan and Kyrgyzstan, some communities founded NGOs to get wildlife management areas assigned and thereby received the right to manage the wildlife in that area for their own benefits. Hunted species are mostly Markhor or Argali, but also Asiatic Ibex. Even if there are few customers and only a few animals are hunted per year, trophy hunting of these species can result in significant revenues for the communities, while, at the same time the populations of wild animals thrive in these areas. In Tajikistan, this approach has recently suffered from fragile political circumstances and is currently not working. However, the increase in wildlife populations observed when these initiatives were piloted serves as evidence for their conservation success. In Kazakhstan, the approach of wildlife management areas in the Saiga range being held by local community NGOs is currently being trialed. Extractive use is accompanied by nature tourism in some areas, which provides additional benefits. Several NGOs which, for example, manage a wildlife area in Kyrgyzstan refrain from hunting and conduct guided tours of the area for tourists instead. A few wildlife watching tours to the Saiga habitat with some involvement of local people have also been successfully conducted.

Feasibility of community-based wildlife management for the focal species

Saiga Antelope

A strong involvement of local people living in the Saiga range is necessary for both tourism and hunting, to ensure sustainability of Saiga use and a peaceful co-existence between people and the antelopes. The development of wildlife-based tourism by local communities can be enabled by legal changes and through financial and technical support for developing wildlife tourism offers. Touristic offers with opportunities to observe Saiga in the wild have been trialed in Kazakhstan. Although none of the current offers were organized by local communities, local people were involved through providing services to tourists. The potential of Saiga-based tourism is currently limited by the remoteness of Saiga habitat, lack of infrastructure, and the variable distribution of Saiga herds throughout the year due to their migratory behavior, making it challenging to ensure that tourists get to see Saiga. Some populations like the Ural and the Pre-Caspian populations or the Tengiz group of the Betpak-Dala population in Kazakhstan are more suitable than others for Saiga observation, but further investment is required to support tourism development, where also local communities can play a greater role.

Hunting Saiga is currently not permitted in any Range State. In recent years some Saiga populations in Kazakhstan have increased to a historic high, since the beginning of record keeping in the 1950ies. Thus, from a biological perspective, sustainable extractive use of the species seems possible in the country. The animals are currently protected by state rangers against poaching and have also been culled in winter 2023/2024 in an attempt to reduce their numbers and alleviate human-wildlife conflict linked to the damage from Saiga herds to agriculture. However, managing a migratory species like Saiga is challenging and requires a lot of preparation. The success of any sustainable use system very much depends on the support by local

communities in the Saiga range and society as a whole. In order to create ownership and positive attitudes towards Saiga, local communities should be involved in Saiga management through the participation in management decisions and additionally through receiving economic benefits from Saiga use. Several options exist to enable such involvement. These are discussed in the study (Section 4.1.2) and listed briefly below:

1. Establishment of management councils for each Saiga population, involving all stakeholders including representatives of local communities. These councils would decide about management questions, determine hunting quotas if possible, and discuss threats and conservation needs, among others. Local participation will create a sense of ownership among local communities.
2. Community-based NGOs (or associations) can get the management responsibility for hunting areas, allowing them to use wildlife for themselves, to organize hunting tourism or wildlife-watching tours.
3. Hunting permits for domestic sports and subsistence hunting. In order to create tangible benefits from Saiga for local people, a certain number of hunting permits could be given to all communities in a Saiga range.
4. Subsidized Saiga meat from large-scale commercial hunting for local communities.
5. Shared revenues from commercial Saiga use and trade.
6. Collection of Saiga horn from natural mortality for inclusion in the overall stockpile management system and additional revenues for local communities.

Ideally, at least one of the first two options should be implemented to involve local communities in decision-making and, additionally, a combination of the other measures to derive economic benefits from Saiga for local people. In order to decide in favor of the best solution, experience from other parts of the world should be studied in more detail, suitable approaches piloted, and effects monitored to be able to adapt management, if needed.

All these measures have the potential to provide significant incentives for people in Kazakhstan to support Saiga conservation and to tolerate them on their land. The varying distribution of Saigas in different seasons and years results in an imbalance of costs and benefits among communities in a Saiga range. In order to establish mechanisms for an assessment of costs of Saiga presence and the just distribution of meat, hunting permits and monetary benefits, the creation of associations of communities and/or wildlife management areas for each Saiga range would be helpful (see Section 4.1.2 for details).

Argali Sheep

Argali provides a good potential for CBWM as well as serious challenges. The species can be an attractive element of ecotourism assets and is extremely important for hunting tourism. Both can be compatible. Argali watching is an economically interesting option in areas without or with only limited hunting possibilities. Such offers may be particularly successful, where picturesque and healthy mountain ecosystems and possibly cultural offers exist, which attract tourists and make the development and maintenance of related infrastructure and services more economically viable. These can be areas with small populations, insufficient for hunting or where hunting is not allowed or not desired, for example.

For huntable populations, application of CBWM with extractive use would be possible and could be economically attractive. In Central Asia, local communities could gain the right to manage wildlife by establishing an NGO, which can become a managing entity of a wildlife management

area. If hunting tourism mainly for trophy hunting is developed in such areas, significant funds can be gained for the benefit of community development and conservation of the species. Domestic subsistence or sports hunting are also possible, but with less benefits. In order to achieve this, the political and legal conditions must enable the assignment of wildlife management areas to NGOs. The legal frameworks currently allow this in most countries. Given the conservation and community benefits arising from such an approach, as trialed in Kyrgyzstan and Tajikistan, it should be promoted and supported by state institutions to be accepted among wildlife managers and by society in general (details in Section 4.2).

Snow Leopard

Community-based conservation of Snow Leopards is possible through wildlife watching tourism and hunting of Snow Leopard prey. The potential for Snow Leopard observations is rather low in the target countries due to the rarity of the species, remote habitats and the cat's elusive behavior. It is difficult to guarantee seeing a Snow Leopard and thus Snow Leopard observations are usually part of a larger tour. Because of this only a limited share of the tour's price actually stays in the local communities in the Snow Leopard range. Nevertheless, a few successful examples of Snow Leopard observation tours exist in the region and their replication should be considered in selected locations with a good potential for developing such offers.

CBWM with extractive use applied to Snow Leopard's ungulate prey has a high potential to generate incentives to preserve the species and their habitat in a similar model as described for Argali. Wildlife management areas, which are assigned to local community NGOs, can be beneficial for wild ungulate populations and, consequently, for Snow Leopards. Income from hunting ungulates is produced for local people, creating positive attitudes and support for wildlife conservation. Experience from CBWM of Snow Leopard's prey has shown that an increased prey availability also leads to growing numbers of Snow Leopards in the area and consequently cases of livestock depredation can also increase. Therefore, measures to mitigate human-wildlife conflict like predator-proof corrals or livestock insurances are an important element to complement the approach and improve Snow Leopard conservation, as already practiced in some areas in the Snow Leopard Range (see Section 4.3 for details).

Bukhara Deer

The legal protection of Bukhara Deer currently allows non-extractive use only, which can be attractive for communities living in and around protected areas, where significant Deer populations exist. Observations of Bukhara Deer in the wild, given its similarity to other deer species are not likely to be a major attraction on their own and may remain only an additional source of income. The Bukhara Deer living in beautiful habitats can become one of the species to watch on wildlife tours in Central Asia, ideally combined with offers to visit cultural sites.

If the national and international legislation and status of Bukhara Deer would change for less protection, hunting may become possible. In some parts of its Range, particularly in Uzbekistan, Bukhara Deer numbers have surpassed the carrying capacity of currently available habitat. Dispersal of Deer beyond protected areas causes conflicts with local land users, which increasingly perceive the Deer as vermin. CBWM could be applied to address this issue to enable local people to benefit from the presence of these animals. Bukhara Deer could be hunted for venison, if population regulation was the goal. This could be useful in some overpopulated areas, particularly in Uzbekistan. Trophy hunting would also be an economically attractive option.

CBWM could be realized through management areas assigned to local community NGOs and designed specifically to include riparian habitat of Bukhara Deer. Other ways of involving local communities are also possible, as for Saiga. For instance, hunting permits in existing wildlife management areas could be given to local communities and venison could be shared with local people. Involving local people through CBWM can support a broader acceptance of Bukhara Deer in society and thereby the conservation of the species. As the species suffers from habitat loss and degradation, revenues from any kind of sustainable use should be directed towards investments in habitat restoration, which would additionally bring benefits for biodiversity in general, including for other endemic species of the region (Section 4.4).

Policy recommendations

As shown in this study for the four focal species, the application of community-based approaches for wildlife management in Central Asia has the potential to provide benefits for the conservation of threatened wildlife outside of state protected areas and for people, who co-exist with it. Creating ownership among local people and enabling them to benefit from wildlife can solve existing conflicts, improve the conservation status of wildlife and, at the same time, the living standards of local communities. This study concludes with a list of recommendations to expand the application of CBWM in countries of Central Asia directed towards national governments, Parties to UN Conventions, and other stakeholders (Section 5):

General recommendations to the countries covered by this study (Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan) for applying Community-based Wildlife Management

- Consider economic benefits of CBWM in decision making as an incentive for improved conservation of wildlife and its habitats as well as a contribution to rural development.
- Consider sustainable, extractive use as a measure of wildlife conservation and base decisions about this on good science.
- Bring species' assessment procedures for Red Books in line with IUCN guidelines.
- Consider allowing limited extractive use of selected Red Book listed species, if it can be shown that this will contribute to the conservation of the species.
- Review existing laws to establish hunting bans only for species threatened by legal hunting. Specifically, give preference to better regulation and control of hunting and consider removing existing hunting bans, which contradict conservation needs and CBWM.
- Review and consider changing legislation on zakazniks and similar areas: 1) to allow the sustainable extractive use of target species, e.g. through a CBWM approach and 2) to ensure that any land use in this area is not harmful to wildlife.
- Encourage the creation of non-profit NGOs on a community level as entities for wildlife management and conservation.
- Promote and support the management of hunting areas by non-profit community-based NGOs as a complementary approach to concessions run by commercial enterprises.
- Review legislation and administrative practices and change it as needed to make it easier for community-based NGOs to be assigned wildlife management areas.
- Consider decreasing the level of monetary liability for poaching by third parties for non-profit NGOs managing hunting areas, where relevant.

- Review existing and develop new wildlife management areas, making sure that these areas are of adequate size to manage wildlife species, taking into account boundaries of community lands, administrative units and topographic features.
- Encourage the creation of associations of wildlife management units for managing wide-ranging species.
- Amend legislation on non-extractive use of wildlife granting managing entities of wildlife management areas exclusive rights to offer tourism services in these areas.
- Develop and implement state funding programmes to support the creation of wildlife tourism offers in the countries of Central Asia.
- Offer capacity building and financial support for the development of environmentally friendly wildlife watching tourism businesses to local communities.
- Consider privately managed protected areas as a measure to achieve the CBD Kunming-Montreal Global Biodiversity Framework goals on area conservation ('30 by 30' target).
- Change the legislation to allow for the creation of private protected areas, where both wildlife and land use should be managed by the organization in charge of the area.
- Identify obstacles for the management of protected areas by non-profit organizations and address them.

Recommendations to Parties of UN Conventions and concerning the involvement of IUCN

To CMS Parties

- Fully implement actions related to CBWM from the CAMI POW and the International Single Species Action Plan for the Conservation of Argali.
- Evaluate the potential of community-based approaches for ecotourism and hunting tourism to improve the conservation of migratory species and their habitats in and also beyond Central Asia and include CBWM in relevant CMS instruments.
- Evaluate experiences of other Conventions (e.g. Vicuna Convention and other relevant policy frameworks) in addressing grazing competition as a threat to migratory species in Central Asia (Section 3.3.3).
- Request the CMS Secretariat to conduct capacity-building activities to inform decision-makers about CBWM approaches, their benefits, associated risks and pre-conditions for success.
- Bukhara Deer Range State Parties to consider delisting Bukhara Deer from CMS Appendix I and maintaining it only on Appendix II in accordance with the listing criteria and the current conservation status of the subspecies, e.g. to enable CBWM with extractive use in the future.

To CITES Parties

- Consider proposing to delete the current annotation of the zero export quota for wild Saiga specimens traded for commercial purposes under CITES and request advice of the CITES Secretariat on the procedure for doing so.

Concerning IUCN

- IUCN SULi and SSC specialist groups should continue providing technical support to CAMI Range States on CBWM approaches;
- IUCN SSC Deer Specialist Group to review IUCN Red List assessment of Bukhara Deer to inform the development of conservation and management measures;

- CAMI Range States to consider engaging the IUCN SSC Human-Wildlife Conflict & Coexistence Specialist Group to receive advice in managing human-wildlife conflicts in Central Asia.

Recommendations to Range States for each target species

Saiga Antelope

- Assess feasibility of community-based eco-tourism with Saiga observation tours in specific locations and provide support for respective business development in most promising locations.
- Create management councils for each Saiga population with representatives from all relevant stakeholders, taking decisions about management questions like sustainable use, monitoring and addressing threats.
- Consider the feasibility of trophy hunting tourism as a source of income for hunting areas in the Saiga range area, particularly for the ones assigned to local community entities.
- If Saiga are hunted commercially on a large scale, some hunting permits for subsistence should be provided to local communities from within the Saiga range allowing them to hunt Saiga at selected hunting areas, where Saiga live during the hunting season.
- In the case of large-scale, commercial Saiga use, consider the provision of subsidised meat to local people as a benefit-sharing mechanism, which can easily be implemented.
- Share future monetary revenues from large-scale Saiga use with wildlife management areas and local communities through a well-defined and transparent distribution mechanism;
- Consider the creation of a fund to support local communities, collecting revenues from commercial Saiga hunting and trade and distributing them to local communities.
- Establish control mechanisms and collection points for horns from natural mortalities;
- Allow collection of horns, resulting from natural mortality, if effectively controlled, to increase benefits for local communities.
- Establish adaptive management of Saiga based on reliable and comprehensive population monitoring;
- Establish effective mechanisms for Saiga horn stockpile management including marking and registration;
- Coordinate with other range states all measures for preparing international trade in Saiga products;
- Develop a proposal for removing the CITES annotation of a zero quota for commercial trade in wild-sourced Saiga products and advocate for its approval by the CITES Conference of the Parties, based on proven mechanisms for effective control of legal harvest and trade and the prevention of illegal trade and laundering of illegal Saiga horns.

Argali Sheep

- Support the development of community-based wildlife watching offers including Argali through initial investment and assistance in tourism product development and marketing, ensuring the link between benefits and conservation efforts;
- For extractive use, assign more suitable areas with potential for Argali management to community-based entities;
- Allocate hunting quotas to community-based entities managing hunting areas when Argali numbers there have reached established thresholds.

Snow Leopard

- Support human-wildlife conflict mitigation measures in the Snow Leopard range financially and technically;
- Consider enabling the creation of private protected areas and community-based tourism development to support conservation of Snow Leopard habitat;
- Consider CBWM approaches with extractive use of Snow Leopard's prey species (Ibex, Markhor, Argali, etc.) to support conservation;
- Provide limited hunting quotas for old male ungulates of Snow Leopard's prey species to holders of wildlife management areas in the (potential) Snow Leopard range in accordance with scientific standards, so as not to harm the population;
- Allow limited domestic hunting of Snow Leopard's prey species only in areas with high densities;
- Allow for a long-term or temporary lease of pasture by holders of wildlife management areas to influence land use for the benefit of Snow Leopard's prey species.

Bukhara Deer

- Support the development of eco-tourism based on Bukhara Deer observations in their natural habitat with the involvement of local communities.
- Consider necessary legal changes to allow hunting of the deer, if removed from CMS Appendix I, e.g. exclusion of the species from Red Books, transparent procedures for setting quotas and receiving permits;
- Consider CBWM with trophy hunting of single males in populations of at least 100 recorded animals and a sufficient share of adults;
- Consider hunting for sport and venison particularly where reduction of population sizes is desirable to avoid habitat degradation;
- Involve local communities in managing Bukhara Deer to pilot CBWM with a perspective of future extractive use or at least share benefits from hunting with local people;
- Prevent farming of Bukhara Deer.
- Create new wildlife management areas with future perspectives of Bukhara Deer use outside of protected areas;
- Consider ways to use CBWM approaches as a contribution to Bukhara Deer habitat conservation and restoration.

List of acronyms

ACBK	–	Association for the Conservation of Biodiversity of Kazakhstan
ANCOT	–	Association of Nature Conservation Organizations of Tajikistan
BfN	–	German Federal Agency for Nature Conservation (Bundesamt für Naturschutz, BfN)
CAMI	–	Central Asian Mammals Initiative
CBC	–	Community-based Conservation
CBNRM	–	Community-Based Natural Resources Management
CBWM	–	Community-based Wildlife Management
CBO	–	Community-based organisation
CIC	–	International Council for Game and Wildlife Conservation
CITES	–	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	–	Convention on the Conservation of Migratory Species of Wild Animals
FZS	–	Frankfurt Zoological Society
GBAO	–	Gorno-Badakhshan Autonomous Oblast
GIZ	–	Deutsche Gesellschaft für Internationale Zusammenarbeit (German international cooperation agency)
ICCA	–	Indigenous and Community Conserved Areas
IP	–	Indigenous Peoples
IWT	–	Illegal Wildlife Trade
KMGBF	–	Kunming Montreal Global Biodiversity Framework
LC	–	Local Communities
NABU	–	German Nature and Biodiversity Conservation Union
NGO	–	Non-governmental organisation
OECM	–	Other Effective Area-based Conservation Measure
WCS	–	Wildlife Conservation Society
WWF	–	World Wide Fund for Nature

Introduction

Population numbers, species diversity and range areas of large wild mammals have been declining rapidly in the last decades. Human populations and livestock numbers have continuously grown in the same period. Globally, wildlife populations monitored between 1970 and 2018 have decreased on average by 69% (WWF, 2022). In terms of biomass of mammals, humans and livestock made up 96% of the world's mammal biomass in 2015, while terrestrial and marine mammals were estimated at around 2% only (Bar-On et al., 2018; Ritchie & Roser, 2021). The latter found that large and medium-sized mammals were particularly threatened or driven to extinction by overhunting, poaching and replacement with livestock. Central Asia is not an exception to this global trend. For instance, Berger and colleagues (2013) found that across seven study areas in Mongolia, India, and China's Tibetan Plateau native ungulate biomass is now less than 5% of that of domestic animals and showed a strong correlation of wildlife declines with the increase in the number of cashmere goats driven by the global demand for their fibre. In most areas of Central Asia wild ungulates and carnivores exist only in fragmented habitat pockets and in much lower numbers than their historic population sizes. This remains true even in cases where related species or species with similar ecological features are doing well in other parts of the world, notably in Europe or Northern America, like Maral Deer *Cervus canadensis*, Bukhara Deer *Cervus hanglu bactrianus*, Siberian Roe Deer *Capreolus pygargus* or Argali sheep *Ovis ammon*. In contrast, there are also examples of stable and recovering wildlife populations in Central Asia, like the Saiga Antelope *Saiga tatarica* in Kazakhstan, Markhor *Capra falconeri* in Tajikistan and several local populations of Asiatic Ibex *Capra sibirica* and Argali *Ovis ammon*. Larger populations of wild ungulates such as these have also been shown to improve the conservation of predators, such as the Snow Leopard *Panthera uncia* (e.g., Kachel et al., 2016, Suryawanshi et al., 2021) and scavengers, like vultures and migrating eagles.

In Central Asia, land is used for livestock production even within some protected areas, with the exception of strictly protected nature reserves (IUCN Category I) and strictly protected zones of protected areas of other categories like national parks (IUCN Category II). However, protected areas and zones usually do not provide sufficient habitat for wide-ranging wild ungulates and larger carnivores. Furthermore, existing bans on the use of land for livestock are often not effectively enforced. Wildlife habitat is in addition degraded and fragmented by other anthropogenic activities, such as expansion of human settlements, construction of linear infrastructure, natural resource extraction. Therefore, wildlife conservation needs to be integrated within landscapes used by humans to at least some extent. In such landscapes, coexistence of humans and large mammals is typically hampered by competition for resources (pasture and water), poaching and human-wildlife conflict especially in cases when wildlife numbers recover. Where large mammals are poached, their tolerance towards the presence of humans, livestock and related infrastructure declines and thus the habitat area available to them becomes significantly reduced.

The coexistence of humans and large mammals, in particular the absence of poaching and tolerance of some impact of wild animals on land use, are more likely achieved when local land users develop a sense of ownership for wildlife and receive some tangible benefits from its existence. Experience from various parts of the world, including some local examples in Central Asian countries, has shown that community-based wildlife management (CBWM) in various forms can be a powerful tool for achieving recovery and conservation of large mammal

populations, reducing human-wildlife conflict and contributing to individual and community wellbeing (e.g. Ostrom, 1990; Murphree, 1993; Cooney et al., 2016; Cooney et al., 2018).

This study explores the potential and challenges of applying community-based wildlife management in Central Asia taking into account the historical background in the region and global experience in using CBWM. For the purposes of this study, communities encompass both indigenous peoples, who possess unique characteristics and internationally recognised rights, and non-indigenous local communities, who live near wildlife habitat. Both are often referred to as 'local communities' or 'communities', particularly at site level scales, and as Indigenous Peoples and Local Communities (IPLCs) at the broader scale and in international policy.

This study has been prepared in the framework of the Central Asian Mammal Initiative (CAMI) of the Convention on the Conservation of Migratory Species (CMS). As the CAMI has a wide geographical scope and covers many different species, not all countries and wildlife species are discussed in this study. The focus is on four former Soviet Union countries of Central Asia, namely Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan, where CBWM has been trialed or interest for such approaches was expressed by the respective CMS Parties. At the same time, some aspects from neighbouring countries are also taken into consideration, in particular from Mongolia, depending on the availability of up-to-date information. Furthermore, the focus in this study is on four species listed under the CAMI, for which sufficient information about their population status and management is available and which are particularly suitable for the topic of community-based wildlife management, mainly because they occur in sufficiently large numbers, are of conservation interest, and offer great potential for both non-extractive and extractive use of wildlife. These focal species are Saiga Antelope, Argali, Snow Leopard and Bukhara Deer. Their specific situations differ, which allows to discuss different possibilities of CBWM development and widens scope of this study. Experiences with applying community-based wildlife management approaches for other species and potentials of combining sustainable use of other species with the management of the focal species have been taken into account where appropriate.

Some of the issues covered in the study are sensitive and not without controversy. For example, the scale of illegal hunting is difficult to track and record. Official data on detected poaching cases are neither easily available, nor do they necessarily represent the full reality. The study therefore partly relies on informal information, the sources of which cannot be disclosed due to the need to protect informants' identities and their privacy rights. To some extent the scale of poaching can also be estimated from population data and animal behaviour. Given the general scarcity of published up-to-date literature from the region, in some parts the authors had to rely largely on their and contact person's personal observations and experiences for their assessments. This is also due to the limited number of publications on pilot projects applying community-based wildlife management in Central Asia. The review of current use and management practices of the focal species and the analysis of challenges and obstacles for community-based wildlife management intends to guide better integration of local people in the conservation and management of wildlife in the region, supporting the revival of local traditions. However, some challenges and examples provided are politically sensitive and might cause problematic consequences for the individuals involved as well as for the political acceptance of the approach as such. Therefore, the authors had to be extremely cautious and were not in all cases able to provide full details of specific situations and disclose all sources of information.

1. Historical role and approaches of wildlife management in Central Asia

1.1 General wildlife management

This Section provides information on the history of wildlife use in Central Asia starting from ancient times until the post-Soviet period. It provides indications of the customs of the indigenous peoples of Central Asia, describes the intensifying wildlife use starting in the 18th century, nature protection and wildlife management during the Soviet period and the consequences of the breakdown of the Soviet Union for wildlife and its management in the region.

1.1.1 Wildlife use in ancient times

Wildlife hunting has been an important element of human livelihoods since prehistoric times (Kean & Howell, 2018). During the Paleolithic Age (the Old Stone Age), especially the second half, collective hunting of large mammals was the main occupation of ancient people (Blank & Li, 2021). Archaeological artefacts in Central Asia from Mesolithic and Neolithic periods include numerous arrowheads. In a cave in the spurs of the Hissar Mountain Range (Uzbekistan and Tajikistan), many hunting tools and numerous bone fragments of animals hunted by the Neanderthal people (between 150,000 and 40,000 BC), including Asiatic Ibex, and infrequently wild horses *Equus ferus*, Maral Deer and others, were discovered (Blank & Li, 2021). The Neolithic period also brought the invention of bows and arrows and the use of dogs for hunting which both made hunting easier, even for very fast and shy animals such as the Saiga Antelope and Goitered Gazelle *Gazella subgutturosa* (Blank & Li, 2021).

Hunted wildlife also had some spiritual and cultural value. In 1958, A. P. Okladnikov discovered a prehistoric burial site in the cave of Teshik-Tash (Kyrgyzstan), where horns of Asiatic Ibex had been displayed around a human skeleton (Maanaev et al., 2015). Similar traditions prevail even until today: the cultural and spiritual value of wild ungulates in some regions of Central Asia is still the reason for displaying their horns and skulls at holy shrines, ancient tombs of important persons, at graveyards and at prominent places of yard entries or halls of houses (Figure 1) (own observations by S. Michel and Kh. Karimov).

Another source of information about ancient connections between wildlife and people are petroglyphs, which can be found in many locations across Central Asia. These petroglyphs have been dated to different periods, some as far back as the Bronze Age. Many petroglyphs depict wild ungulates, in particular Asiatic Ibex, wild sheep and deer. Some petroglyphs show hunting scenes, notably with bows and arrows, and sometimes with hunting dogs (Figure 2). Petroglyphs from Saimaly-Tash in Kyrgyzstan showing hunting scenes have been dated back to the Scythian-Saka (VIII - III century BC) period (Tashbaeva et al., 2001). Petroglyphs created by the ancient Kyrgyz of the Yenisei region also show explicit hunting scenes (Evtyukha, 1948).

Figure 1: Skulls and horns of Asiatic Ibex and Marco Polo Argali displayed at a mazar (holy shrine) in the Wakhan (Gorno-Badakhshan Autonomous Oblast, Tajikistan). Photo: Michel

Figure 2: Petroglyphs with hunting scene showing use of bow and arrow and hunting dog. Lyangar, Wakhan, Tajikistan. Photo: Thieme.

Hunting wildlife is also the purpose of ancient “arrow-shaped” stone wall structures – so-called “aran” – at the Ustyurt desert plateau of Kazakhstan and Uzbekistan, more widely known as “desert kites” (Figure 3). These structures are located at different places on the plateau and at its outer edges. They were used as traps for herds of wild ungulates. Hunters would drive the animals into these traps, taking advantage of the cliff of the Ustyurt as a natural barrier. The animals were driven towards the end of the stonewall funnel, leading into a corral with trapping holes (Figure 4; Crassard et al., 2022).

In the Ustyurt, the oldest “arans” predate burials from the 5th to 2nd century BC. The presence of pottery or other artefacts suggests that such structures originate from around the 4th-2nd centuries BC and the most recent from the 13th-14th centuries AD. More recently, ethnographic records from the 1920s reported that “stone structures with deep ditches” were used for hunting “wild ass, wild horse and antelope” (Amirov et al., 2014). Other descriptions of the hunt with the help of these structures are available from the 19th century. Hunted species included Saiga, Goitered Gazelle and Transcaspian Urial *Ovis vignei arkal* (Amirov et al., 2014), as well as equids, which are now locally extinct. The century-long use of these structures – possibly more than two millennia – suggests that the main hunted species survived for long periods in some considerable populations, although “arans” were designed and used for mass killings (Deom & Sala, 2009).

Figure 3: Arrow-shaped “aran” structures for hunting in the Ustyurt. Photo: Michel.

Figure 4: Stonewall of "aran" structures to funnel wildlife into a trap. Photo: Michel.

Folklore of indigenous peoples of Central Asia also reflects historical relationships between people and wildlife. Examples include the Kazakh legends of Aksak Kulan, Aksak kiik, the Kyrgyz legend of Kojojash and others. Some of those stories draw clear lines between moral and immoral behaviour towards animals, others include elements of hunting rules which aimed at ensuring sustainability of hunting.

For example, the Kyrgyz legend of Kojojash is centred around the most skilled hunter Kojojash, who kills the whole family of a wild goat Kaiberen. As the goat Kaiberen begs the hunter not to kill her and Alabash, the father of the kids, so that she could give birth to new offspring, Kojojash proceeds to kill Alabash. Kaiberen lures the hunter into a steep and labyrinthic rock formation from which he would never find his way back thus punishing the hunter (Aitpaeva, 2006). Similar legends, but also songs and poetry can be heard in many rural areas of Central Asia, typically illustrating ancient hunting rules.

Other ancient tales from the region included limits in terms of numbers of animals a hunter is allowed to shoot during a season or even during his lifetime. In these legends, the violation of such rules, which may also include the ban on killing pregnant females or those with dependent offspring, causes supernatural punishment of the violator (Statements by traditional hunters in Kyrgyzstan and Tajikistan to S. Michel). Thus, folkloric tales also provide indirect evidence of the existence of traditional hunting rules, defining moral behaviour or limiting hunting to ensure sustainable use.

1.1.2 17th to 19th century

In the 17th century hunting was an essential part of people's lives in Central Asia, as wildlife products were widely used. For instance, skins were used to produce clothes, footwear and flasks (Blank & Li, 2021). Hunting with horses, dogs or game birds like Golden Eagles (*Aquila chrysaetos*) and falcons or a combination was common, but also hunting tools like nets and traps

were used. Other methods existed for mass killings of fast animals. Reports from the 18th century mention well-developed hunting practices, which involved groups of people to hunt Saiga antelopes. Bannikov (1963) describes the following method, which was used to kill large groups of the antelopes. Two walls from soil material were built in a funnel shape. At the thin end there were reeds on the ground cut to a length of about 70 cm. Saiga were pushed into this funnel, ending up in the sharp reeds and injuring themselves, leading finally to their death. Other hunting methods included chasing them on to ice or making hole traps near waterpoints.

From the 17th until the early 20th century, hunting for fur trade became ever more important, particularly in Kazakhstan. Ungulates were also hunted for meat, and in addition red deer (Maral, Bukhara Deer) for antlers and Saiga Antelope for horns. As a result, the natural ranges and populations of many ungulates and fur-bearing animals decreased significantly, but first attempts to introduce hunting legislation failed to change this situation (Blank & Li, 2021).

Originating in ancient times, some of the rules and beliefs described in Central Asian folklore tales have been in force until recently or are even still applied by local hunters in remote areas. Such informal rules are likely to have played a role in ensuring sustainability of hunting of wild animals as described in Section 1.1.1. For instance, a local resident and former informal hunter of a village in Shohdara valley (Gorno-Badakhshan Autonomous Oblast (GBAO), Tajikistan) explained that in pre-Soviet times there was only one or a few hunters in each village. These would hunt only in defined areas, supply meat to the community and ensure that the local population of Asiatic Ibex would not be overhunted (Navruzshoev, pers. comm. 2005).

Intensified hunting of wild ungulates and equids in the 19th and at the beginning of the 20th century caused massive population declines and local extinctions. This is linked to the expansion of the Russian Empire into parts of Central Asia and the resulting intensified use of natural resources and trade between Russia, Europe, Central Asia and China. As more opportunities for trade emerged, the demand for wildlife products increased, in turn causing more hunting (Blank & Li, 2021). The main purpose for it shifted from subsistence to the production of goods for trade, involving also more advanced hunting techniques. First protected areas in the territory covered then by the Russian Empire were also being introduced at this time by private landowners or by the government (Popov, 2020), but this process did not prevent negative effects of intensive hunting on species targeted for trade purposes. The Asiatic Wild Ass disappeared from large parts of its former range during the late 19th and early 20th centuries and the Wild Horse even earlier (Heptner et al., 1988). The numbers of Saiga declined sharply from the end of the 18th century in the western part of its range and throughout the whole range during the 19th century due to overhunting (Sokolov & Zhirnov, 1998).

The main driver for this was likely the demand for horns and the involvement in hunting of Ural Cossacks (Blank & Li, 2021). Saiga horns were bought by traders and sold at high prices to China. For instance, between 1840 and 1850, traders from Bukhara and Khiva (Khanats) sold 344,747 pairs of Saiga horn to China, which illustrates the scale of Saiga hunting at that time (Bannikov, 1963). Other species became extinct completely like Tarpan or locally like the Beaver. In general, fur-bearing animals were particularly targeted during these decades and their population sizes dropped, among them wolves, foxes and otters (Blank & Li, 2021). However, as no wildlife monitoring had been in place, the fate of and effects on many more species occurring in the region are unknown.

1.1.3 The period of the Soviet Union

As described in the previous section, towards the end of the 19th and at the beginning of the 20th century wildlife in Central Asia was subject to high hunting pressure. This almost resulted in the extinction of the Saiga Antelope, while other ungulates, e.g., Goitered Gazelle, wild sheep (*Ovis spp.*), as well as several carnivore species declined or went locally extinct. In response, during the early Soviet period, the authorities began to develop legislation to address overhunting, including prohibitions of mass killings of animals and use of poisons and to create protected areas, but at the same time allowing and incentivizing culling of "harmful" animals, such as tigers, Snow Leopard, bears, wolves, and other carnivores as well as birds of prey, causing population declines and even the extinction of the Turan Tiger *Panthera tigris tulliana* (Blank & Li, 2021).

The concept of protected areas was introduced in Central Asia during the Soviet period. The Soviet protected area system initially included the category of strict nature reserves (zapovednik) prohibiting any form of anthropogenic activities apart from research, and nature sanctuaries (zakaznik) which were areas with temporary restrictions on human activities for conservation purposes. Later also national parks were added, where tourism and ecological education activities were allowed in otherwise mostly undeveloped landscapes.

Throughout the Soviet period, over thirty strict nature reserves (zapovedniks) were established in Central Asian republics. The time of their establishment ranged from the 1920-1930ies, when the first protected areas of the region such as Aksu-Dzhabagly, Barsakelmes, Tigrovaya Balka were gazetted, to the 1980ies, when such areas as Narynskiy and Dashti-Dzhum were added (Sokolov and Syroechkovkskiy, 1990). Territories covered, nature protection regimes and enforcement of nature protection varied between years and locations, all affecting the conservation effectiveness of these measures for large mammals. However, strictly protected areas alone are generally too small to conserve populations of wide-ranging CMS-listed species, such as those covered by this study, making restriction of use and protection measures beyond strictly protected areas a necessity.

Zakazniks covered a much larger area of the Soviet Union than zapovedniks. In a zakaznik different types of land use were possible, but restricted for a defined period of time, typically 5-10 years, aiming to allow for recovery of certain species of plants or animals. In a zoological zakaznik aimed at protecting wildlife species hunting was prohibited. During Soviet times this concept was functional with a variable success, as government-steered restrictions within these areas were enforced to different extents. Zakazniks still exist throughout Central Asia, but most of them have become restricted use areas for an indefinite time period, while enforcement of restrictions has become almost unachievable (see section 3.4.2).

In terms of wildlife use, hunting became integrated into the overall top-down planned economy with a distinction between so-called commercial and sports/recreational hunting. The latter was partly organised as a lucrative activity for high level state officials at elite hunting areas. In addition to these two main types of hunting, there was also hunting of "harmful" animals, which was hardly regulated. Large-scale commercial hunting was exclusively controlled by centralized state organizations, which were responsible for hunting and selling the hunting products as well as for the protection of the game species. Sport and recreational hunting for "ordinary" people was organized through associations of hunters and fishermen –established formally as non-governmental organizations in 1953. As these associations regulated the access to government-owned resources, and membership in these associations was the precondition for obtaining a hunters' license, which assigns the right to own and use a firearm to the hunter and provides access to hunting permits, these associations were de facto an element of the state management system. Despite this, during the Soviet period, poaching continued and in combination with

official overharvest also contributed to rather heavily fluctuating population sizes, massive wildlife declines, and even extinctions including that of the Turan Tiger, which was considered harmful and purposefully extirpated (Blank & Li, 2021).

However, remarkable species recoveries have also been achieved by the Soviet wildlife management system. The recovery of the Saiga Antelope is the most famous example resulting from an early Soviet hunting ban combined with restrictions on the possession of firearms. In the early 1920s Saiga could be observed only in small groups occupying tiny, disconnected patches of their former wide range, but the population recovered rapidly during the 1930s and 1940s and permits for hunting were issued in the 1950s. For instance, in 1954 the authorities allowed 50,000 Saiga to be shot. In the second half of the 1950s hunting of the Saiga population in the Pre-Caspian region became state-controlled, and a state hunting brigade was established (Bannikov, 1963). At the same time, a wildlife service was created to protect Saiga from illegal hunting. Saiga and other wildlife were also protected by the well-developed regional hunting inspectorates. Aerial population counts were undertaken under a governmental programme in order to establish the population size as a basis for setting hunting quotas. This system was expanded in subsequent years eventually covering all Saiga populations until the end of the Soviet Union, with annual hunting, causing fluctuating, but never completely collapsing population sizes (Sokolov & Zhirnov, 1998).

Besides such enforced management measures, social and economic tragedies and crises documented during the first half of the twentieth century affected not only people but likely also the wildlife of Central Asia. For example, in Kazakhstan, the Asiatic Wild Ass became extinct at the time of the great famine during collectivisation in 1932 (Sotnikov, 1986). On the other hand, forced sedentarization of nomadic people coupled with a tragic reduction of human population due to famine may have decreased the presence of people in wildlife habitat thus contributing to wildlife population recoveries. For example, this is thought to have contributed to the recovery of the Saiga by 1950ies. The resettlement of people from other parts of the Soviet Union into Central Asia during the second world war and also later for agricultural development on the contrary may have negatively affected habitat use by Saiga and other wildlife. However, the authors of the study are not aware of any scientific studies or reports showing the effect of these dramatic societal and economic changes on Central Asian wildlife.

The main causes for fluctuations in the Saiga population numbers, which were quite strong in some years, were caused partly by natural mass mortalities, and partly by overly intensive legal and illegal harvests (Sokolov & Zhirnov, 1998). The Saiga harvest quotas in some areas might have been set excessively high for the deliberate purpose of limiting population growth and preventing the expansion of the range area into lands used for intensive agriculture. Inaccurate monitoring approaches and the motivation of the harvest brigades to maximize their fulfilment of plans might have also contributed to excessive offtakes. Reports by eyewitnesses and participants of the late Soviet Saiga harvest suggest that poaching by local people and unreported commercial harvest for local delivery of meat might have been substantial enough to affect population dynamics.

The Goitered Gazelle is an example of a species decimated by commercial harvest for meat during the Soviet period. Hunting of Goitered Gazelles was practiced with vehicles with spotlights at night. According to Heptner et al. (1988) this practice had been banned throughout the USSR, but local people reported its application in the industrial harvest of gazelles still in the 1970s, e.g. in the south-eastern Kyzylkum desert of Uzbekistan (Stöck, pers. comm. 1993). In Kazakhstan, the Goitered Gazelle has been strictly protected since 1978 (when it was included in the first Red

Book of Kazakhstan), but illegal hunting (mainly for entertainment) continues until today despite high monetary penalties and the danger of imprisonment.

Wild sheep have also been subject to commercial harvest for meat supply. The number of Argali in the Eastern Pamirs of Tajikistan was estimated by Sapozhnikov (1976) at 70,000-80,000 during the 1960s, but later estimates were substantially lower, e.g. Fedosenko & Lushchekina (2005) estimated 11,500-12,000 for the early 1990s. This difference has been explained by a possible overestimate by Sapozhnikov as well as anecdotal evidence of an intensive commercial harvest for supplying meat to state employees.

In south-western Tajikistan local people reported that during Soviet times the Bukhara Urial *Ovis vignei bocharіensis* population has been decimated by state-organized commercial harvest for meat, with "truckloads of Urials" taken from the area (Shakula, pers. comm. around 2009). These reports might be an exaggeration as Sapozhnikov (1976) reported that Urial density in this area was rather low (0.6 – 1 per km²). Fedosenko (2002) mentions poaching as the reason for the substantial decline of Urial during the 1960s in parts of their range area in Tajikistan. Therefore, unsustainable offtake resulting from both state-controlled harvest and poaching were likely reasons for the declines of these ungulates.

To restrict extractive use of endangered species, Red Books were introduced at the end of 1970ies with country-specific Red Books being published in the 1980ies for Central Asia. Species, which are considered rare and/or endangered and therefore should be legally protected, are listed in Red Books. Their assessment for inclusion in Red Books was based on expert knowledge without clear criteria and was focused on species, which are particularly attractive, locally rare or declining due to extractive use. The concept of Red Books is still applied across the region today, although with some modifications and challenges (see Section 3.4.2).

1.1.4 From post-Soviet times to the present day

With the collapse of the Soviet Union, countries of Central Asia faced a deep economic crisis resulting in a lack of funding for state institutions including nature protection agencies. At the same time, mass emigration of people additionally contributed to a reduced capacity for wildlife management. Hence, during the post-Soviet period, institutions of wildlife conservation and hunting management were substantially weakened leading to a lack of law enforcement and in turn an intensification of poaching by people, suffering from a lack of income and employment (Blank & Li, 2021).

The following paragraphs provide selected examples of the effects of the post-Soviet crisis on wildlife in Central Asia. In Tajikistan a civil armed conflict flared up during the 1990s which caused a massive wave of poaching of wildlife (Michel & Rosen, 2024). During the 1990s and 2000s the food supply of the country's border guards was poor, and Argali meat was a welcomed enrichment of the guards' ration. They either poached themselves or lent weapons and ammunition to experienced local poachers. The use of automatic military weapons had devastating effects as many animals were not immediately killed but wounded and died later. In Kyrgyzstan, reportedly poorly paid and supplied rangers of a newly established strictly protected area were themselves engaged in poaching, leading to the decline of native ungulates and Snow Leopards in that area (pers. comm. by anonymous eyewitnesses to S. Michel, 2005).

In Kazakhstan the de facto opening of borders for international trade combined with poverty in rural areas and a lack of proper remuneration and control of wildlife management personnel triggered intensive poaching of Saiga Antelopes, which were used not only as a source of food, but also as a source of income from exporting Saiga horns for the traditional Chinese medicine

market (Milner-Gulland, 2001). During 1995–2004, 67 t of Saiga parts and derivatives (mainly horns) from around 280,000 Saiga Antelopes were legally traded; in addition, an unknown number of horns were traded illegally (Blank & Li, 2021). This was especially dramatic, as the focus on hunting males led to a skewed sex ratio in the population and to a reproductive collapse (Milner-Gulland et al., 2003). Together with other factors like diseases and harsh winters, which affect the Saiga population size, this caused an unprecedented rapid decline in Saiga numbers (Milner-Gulland et al., 2001).

Evolution of private wildlife management in Central Asia

Since the market-oriented reforms, which had started already in the Soviet Union in the late 1980s and continued following the independence of the Central Asian countries, possibilities for private organizations to manage wildlife have emerged. The system of hunting management areas, as it evolved during the Soviet period, where wildlife was harvested by state agencies, or by domestic sports-hunters, provided the basis for the development of an area-based wildlife management in Central Asia. In this system, hunting areas are assigned to private legal entities, which manage the area, have an obligation to protect its wildlife and in turn can get hunting permits for own use or sale, but do not control the land use.

These changes have enabled international hunting tourism to become an important element of wildlife use in Central Asia. The private business became involved in an emerging trophy hunting industry with foreign hunters, providing local services like permits, transportation, accommodation, and guidance for hunters, who bought their tours via western hunting outfitters. The results of the development of privately managed hunting areas for international hunting tourism varied (Michel & Rosen, 2024).

Despite the restrictions described above, hunting of Red Book species was possible in some periods subject to high-level decisions. For example, all subspecies of *Ovis* have been in Kazakhstan's Red Book since 1978. From 1990 until 2002 wild sheep were used for international trophy hunting tourism under special permits issued by the government. It was announced as a scientific experiment with the participation of representatives from the Institute of Zoology. In total, 166 males were killed in this period officially, mainly in Central Kazakhstan and Mangystau region. Data on illegal use during the same period is missing, but there is unproven information about the organisation of parallel illegal hunting for foreigners, while other sources suggest that these hunts contributed to the conservation of the target populations (Frisina, 2002; Ismailov, pers. comm. 2022). Since 2003, no permits have been issued for hunting wild sheep in Kazakhstan.

Legal wildlife use developed quickly in Kyrgyzstan, and by 2010 nearly 100 hunting concessions offered hunts of Argali and Asiatic Ibex. Many concessions were too small for the conservation of ungulate populations and for a biologically sustainable and economically viable operation. In this situation, rangers were not employed, guards of hunting camps poached for subsistence and trade in meat, quotas were exceeded, and hunters were illegally guided into areas outside of the actual concessions. The law "On hunting and game management" (2014) defined minimum area sizes and since 2016 the Kyrgyz Government created larger blocks of typically 100,000 ha or larger to be assigned to a single concessionaire, which is more likely to host a viable population of huntable species (Michel & Rosen 2024).

In Tajikistan most of the range area of Marco Polo Argali *Ovis ammon polii* outside of strictly protected areas is covered by commercial hunting concessions, at least as far as areas with considerable populations of the species are concerned. The holders of these concessions joined into the "Association of Hunters" in 2010, which arranges the allocation of Argali quotas among

its members. Areas outside the Argali range area but with considerable populations of wildlife species, which are attractive to foreign hunters, are largely assigned to private companies, some of these established by families from local communities. Some hunting concessions have the reputation of doing successful anti-poaching work by controlling the area through their own staff, informal networks, and collaboration with police, national security service and border guards. In such wildlife management areas, wildlife numbers have been stable or increasing over the last decades, e.g., in the south-eastern Pamirs where Marco Polo Argali are thriving (Valdez et al., 2016) or in areas along the Panj river, where Markhor *Capra falconeri* recovered (Akramov et al., 2022).

Figure 5: Information signpost of wildlife management area, Kazakhstan, 2018. Photo: Michel

Since around 2008, authorities in Kazakhstan have attempted to assign all areas suitable for hunting to legal entities on a competitive basis. Attractive areas with substantial huntable wildlife are assigned by now, but vast areas with either low numbers of game species or areas with Saiga Antelope, which were subject to a hunting moratorium until the end of 2023, and with uncertainty about future use arrangements, are taken only in a few cases. Nevertheless, the huge areas in the range of the Betpak-Dala Saiga population (Central Kazakhstan) have been assigned as their managers are expecting to be able to hunt Saiga in the future. Overall, in 2021 there were 729 hunting areas in Kazakhstan, with a total area of 120,000,000 ha (44,2% of the country); they cover 53% of the territory potentially suitable for hunting in Kazakhstan (223,000,000 ha; 82% of the country). The number of hunting area rangers is more than 2,700 people.

In all Central Asian countries hunting by domestic hunters was, or is, allowed in wildlife management areas which belong to associations of hunters and fishermen, in state forest enterprise areas as well as in unassigned hunting grounds, formally managed by central governmental wildlife/hunting management agencies. These areas have or had in common a very limited control of regulatory compliance and very limited protection against poaching. Hunting in such areas was and sometimes still is based on permits, which are not always bound to specific locations, sometimes only indicating a larger administrative unit. Some hunters even used

permits with an indicated offtake quota multiple times, e.g., in Kyrgyzstan hunting three instead of one permitted Asiatic Ibex (A. Uhlemann, pers. comm. 2010). All these issues related to such kind of hunting by domestic hunters have contributed to the lack of a sense of ownership for wildlife and thus to the decline of wildlife populations. For this reason, at least in Kazakhstan and Kyrgyzstan attempts have been made to assign all hunting areas to legal entities and to allow hunting only in those controlled wildlife management areas (pers. comm. by S. Sokolov 2008 and A. Musaev 2009 to S. Michel).

In Kyrgyzstan, hunting moratoria for some wildlife species were introduced for certain regions until 2030. These include Asiatic Ibex, Argali, Roe Deer, Wild Boar, and Himalayan Snowcock. As some of these regional moratoria are phasing out, a new initiative for an overall hunting moratorium on certain species has been started. The goal of current and future moratoria is a population recovery for the protected species. However, legal hunting is an unlikely threat to these species, as hunting quotas are too low to cause population declines. Hunting moratoria do not address such major threats, as overgrazing, poaching and human-wildlife conflict, which are actually causing population declines and thus introducing the moratoria is not likely to achieve population recovery.

For instance, the official quota for Argali is about 100 animals out of a reported population of 18,900 outside of protected areas, for Asiatic Ibex the quota is 600 out of a population of 40,000 outside of protected areas, which is equal to 0.5% and 1% of the population respectively (Department BDCPA, 2022; Kubanychbekov, pers comm. 2022). The actual impact of legal hunting on the population development is even smaller, as only old male Argali are hunted and a large share of the hunted Asiatic Ibex are also males. These species have polygynous mating systems and thus taking of a few males does not impact reproduction. In addition to that, enforcement of the hunting moratoria is weak, especially as there is no total hunting ban, and firearms remain legal, allowing poaching to continue or increase as incentives for hunting concessionaires and their staff to comply with the moratoria are lacking. These are the reasons for the lack of success of the existing local moratoria in achieving their stated aim of allowing populations to recover.

In Mongolia, hunting is not permitted in state specially protected areas of national level according to the legislation, but it is possible to establish hunting areas within local protected areas. By combining the status of a local protected area with the establishment of a hunting area, it would be possible to protect this area, for instance, from mining exploitation while implementing sustainable wildlife management (Amgalanbaatar, pers. comm. 2022).

In Section 1.1 we described the significance of wildlife for the traditional lifestyles of Central Asian people starting from ancient times, then the decline of wildlife species following the expansion of the Russian Empire and intensified hunting for trade; followed by the establishment of legislation on nature protection, wildlife management and mismanagement during the Soviet Period, effect of socio-economic crises on wildlife and finally current emergence of community-based initiatives in the region. Nature protection measures and legislation, including the establishment of protected areas and procedures for listing endangered species have largely developed during the Soviet period in Central Asia, which still affects the legislation of the target countries related to wildlife management to different extents. Despite some successes of these measures, excessive legal and illegal hunting of large mammals, such as Goitered Gazelles, Tigers and others led to declines and even extirpation of some wildlife species. Most importantly, however, the involvement of local people in wildlife and nature management and the feeling of ownership of

local people towards wildlife has been dramatically weekend since 17th century until today, as described in the next Section.

1.2 Wildlife management involving local people

Building on the overview of the history of wildlife management in Central Asia in the previous section, this section focuses on the involvement of local people in wildlife management, providing the basis for further considerations on the topic of this study.

Local people governed most wildlife management before the Russian colonial and Soviet periods, whether institutionalized or not. While traditional wildlife use by local people mostly happened for subsistence, the expansion of the Russian Empire and resulting increasing trade led to other motivations for hunting, overruling the traditional procedures, and decreased the involvement of local people (see Section 1.1). Where local traditions and feeling of ownership were lost, due to centralised management with little or no inclusion of local people's interests, poaching has had particularly devastating effects.

In many cases traditional wildlife use by indigenous peoples implied formally unregulated hunting, although the legends mentioned in Section 1.1 and the economic, cultural and spiritual importance of wildlife, in particular of wild ungulates, suggest that traditions and customary laws already set some regulations or limits, which aimed to ensure sustainability of use. For instance, traditional approaches, which were based on area-related hunting rights and obligations in the context of natural resource use by local communities, existed in the western Pamirs and Wakhan of Tajikistan and Afghanistan. Selected local hunters reportedly had exclusive rights to hunt in certain areas, probably at least in some cases combined with the obligation to share parts of the harvested game meat within the community (pers. comm. by community members to S. Michel).

In another example, a local hunter in the village Dogorghunt in the Wakhan corridor of Afghanistan presented to visitors a head and two skins of an Urial in 2009 (Figure 6). He explained that he hunted only in the section above the village between two gorges and that no one else had the right to hunt there. He estimated that the Urial population in that area numbered around 30 individuals and said that he would base his decision about the offtake on his assessment of lamb survival (Akhmadsho, pers. comm. 2009). Later observations of around 60 Urial above the same village (Alidodov, pers. comm. 2009) and survey results by WCS Afghanistan (Moheb et al., 2012) showed that the local Urial population had been used for local traditional hunting without negative effects on the population size in a sustainable way, while on the Tajikistan side of the Wakhan the species was extirpated despite being formally protected.

The Soviet state-centred system of hunting management allowed for some involvement of local people. This involvement was mainly limited to employment or to the obligation to deliver the hunted game to central collection points. For sports and recreational hunting, local people could become members of the responsible associations of hunters and fishermen and obtain permits for the right to hunt wildlife species. Formally, all members of these associations had a voice in decision-making of the association or its local branch. However, as planning of hunting area delineation and management as well as setting of hunting quotas and their allocation were centralized, very little opportunity existed for these associations to make own management decisions. These associations had a limited representation of local people and were managed centrally with substantial power concentrated in their national-level headquarters.

Figure 6: Traditional hunter with skull and skins of Urial outside of his yard – another skull above the entrance. Wakhan, Afghanistan 2009. Photo: S. Michel

In some parts of Central Asia, notably in Kazakhstan, Kyrgyzstan and Turkmenistan, traditional hunting with bow and arrow, birds of prey (mainly Golden Eagle) and sighthounds (tazy and taigan dog breeds) was allowed during the Soviet Union time. However, traditional hunters and breeders of taigans in Kyrgyzstan report that in the Soviet Union these sighthounds were considered to be poaching tools and were systematically eradicated by law enforcement officers, almost causing the extirpation of this ancient and culturally important dog breed (pers. comm. by traditional hunters to S. Michel). What originally had been an attempt to reduce poaching, might have actually been perceived by local people as a campaign against their centuries-old hunting tradition, further reducing the ownership attitudes of local people towards wildlife.

The Saiga Antelope has also historically been used as source of meat by people living in the steppe. There is evidence for this use of Saiga stretching back to pre-historic times. However, the intensifying trade in Saiga Antelope horn during the 19th century led to overexploitation of Saiga populations and a decrease in numbers. During the Soviet period, Saiga received better protection through extensive enforcement measures, but local people were excluded from hunting and managing Saiga. Only in some years before the start of the state-controlled industrial-scale commercial hunting of Saiga also domestic hunting by local people was allowed, which resulted at times in extremely high numbers of hunted animals, leading to strong fluctuations in population numbers. Yet, the populations of Saiga were sustained and never crashed completely during the Soviet period. Later, during the collapse of the Soviet Union and

in the resulting enforcement vacuum, poaching has almost caused the extirpation of the species (Section 2.2.1).

Currently, some projects and policies are being introduced in Central Asia to support the involvement of local people in managing the wildlife living close to them to compliment enforcement efforts. For instance, in 2019, the government of Mongolia decided to set up a co-management council for the Mongolian Saiga population together with NGO representatives, a new approach, which had not been previously tried (Chimeddorj, 2020), which would allow for a greater involvement of local people. The recently developed Strategy for the Conservation and Management of Saiga in Kazakhstan (CMS, 2023) also foresees the involvement of local people in Saiga management, for example, through the establishment of the Saiga management councils.

The current systems of assigning wildlife management areas to legal entities, as established in Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan since the 1990s, provide a legal basis for the potential development of community-based wildlife management in defined areas. Since 2008 this mechanism has been used for developing CBWM in Tajikistan, since 2010 in Kyrgyzstan and most recently in 2022 the first community-based wildlife management area emerged in Kazakhstan. The evolving application of this approach in these countries, successes achieved, challenges and setbacks experienced are described and analysed in Section 3.4.

W*ildlife has historically played a major role in the lives of local people, their subsistence, traditions, beliefs and customs. Populations of wildlife were used and managed by indigenous peoples. However, with the expansion of the Russian empire and the creation of the Soviet Union, which both promoted the roles of the state or commercial stakeholders, the role of locals in managing wildlife has diminished. At the time of the Soviet Union wildlife management and protection legislation was developed and established in Central Asia. However, Soviet nature conservation and management relied on centralized governance, marginalizing the contribution of local people and their traditional approaches. At the same time, unsustainable legal and illegal use of wildlife occurred, caused declines and extirpation of some animals. Only those species which were extensively protected and managed by the centralized system prospered. As a consequence, traditional approaches and knowledge of wildlife management have widely been lost, but still remain in some remote mountainous regions. In recent decades, some policies and projects have slowly been developing, aiming to increase the involvement of local people in managing wildlife.*

2. Wildlife species discussed in this study

2.1 Selection of focal species

As not all species covered by CAMI can be exhaustively discussed in this study, four species were selected to demonstrate how different community-based approaches can be applied to improve their conservation and management, allowing for a transfer of developed recommendations to other CAMI species. To select the focal species of this study, all species of CAMI were evaluated against the following suitability criteria:

1. *Available knowledge and data*: Showing a rough assessment by the authors of the amount of data and knowledge available to them and the public about the species.
2. *Potential for the involvement of communities in management*: Here we conducted a pre-assessment from our experience about the potential for involvement of local communities in the management of a certain species considering the peculiarities of the species' behavior, its habitat and distance to people.
3. *Existing community-based management approaches*: This reflects the number of already existing examples of community-based management of the species known to the team of authors.
4. *Relevance for the region*: This criterion was assessed by looking at the distribution range of the species and the number of countries in which a certain species occurs.
5. *Need for action*: This criterion reflects the need to develop new management mechanisms for a certain species with a closer involvement of local communities to address existing problems.

Based on the assessment in Table 1, the following four CAMI species were selected as focal species:

1. **Saiga Antelope**: An iconic species of the steppes of Central Asia, spread over several countries: Russia, Kazakhstan, and Mongolia, with one population wintering in Uzbekistan. The significant population growth in Kazakhstan in recent years has raised conflict with local people and led to discussions about a sustainable use of Saiga. This study aims to contribute to addressing these issues.
2. **Argali Sheep**: A species of wild sheep, very attractive for hunting, which can be found in 11 of the 14 CAMI countries. examples for community-based wildlife management of the species exist in the region, for instance, in Kyrgyzstan and Tajikistan. A lot of lessons were learnt while applying such approaches, which are worth sharing in this study to develop clear recommendations for replication elsewhere.
3. **Snow Leopard**: One of the most prominent wildlife species of the region, found in almost all CAMI countries. It is threatened by poaching, but also by prey depletion due to illegal and unsustainable hunting. Examples of good conservation practice, including non-extractive use of Snow Leopards as well as examples of sustainable hunting management of Snow Leopard prey by local communities exist especially in Kyrgyzstan and Tajikistan with a good potential for dissemination to other countries.
4. **Bukhara Deer**: A well-studied species, suitable both for wildlife watching and hunting. It has a lot of potential for the application of CBWM and there is also the need to act, as in some areas its numbers have grown too high, causing habitat degradation and conflicts with people.

Table 1: Assessment of suitability of CAMI species for this study.

CAMI species	Available knowledge and data	Potential for involvement of communities in management	Existing community-based management approaches	Relevance for the region	Need for action
Argali					
Asiatic Cheetah					
Asiatic Wild Ass					
Bukhara Deer					
Chinkara					
Chiru					
Gobi Bear					
Goitered gazelle					
Kiang					
Mongolian Gazelle					
Persian Leopard					
Przewalski's Horse					
Saiga antelope					
Snow leopard					
Tibetan gazelle					
Urial					
Wild Camel					
Wild Yak					

Suitability for assessment: high middle low

2.2 Status of the focal species

In order to assess the feasibility of CBWM for the management of the focal species, it is necessary to understand the state of their populations. This chapter summarizes available knowledge and indicates current trends. The extent of scientific knowledge about the populations differs significantly between the focal species. While sufficient data exists for the Saiga Antelope and Bukhara Deer, systematic population counts are not conducted for Argali across its range, which makes assessments less reliable. For Snow Leopards camera trap surveys are the only source of information to produce estimates for the status of the species. In cases of data gaps, expert estimates of current status and trends are provided.

2.2.1 Saiga Antelope

Taxonomy and distribution range

The Saiga Antelope is an ungulate species, roaming the steppes, semi-deserts and deserts of Central Asia. According to IUCN there are two subspecies: The nominate subspecies *Saiga tatarica tatarica* exists in Kazakhstan, Russia, and Uzbekistan. The Mongolian Saiga *Saiga tatarica mongolica* lives in Mongolia. International conventions (CMS and CITES) regard them as two different species: *Saiga tatarica* and *Saiga borealis* in accordance with their standard nomenclature based on Wilson & Reeder (2005). In this study, we follow the IUCN classification. Primarily the nominate subspecies occurred also in China, where it became extinct around the

middle of the 20th century (Cui et al., 2017). Historically, Saiga also used to migrate to Turkmenistan in winter, with a decreasing intensity towards the end of the time of the Soviet Union. While there is only one Mongolian Saiga population, *S. t. tatarica* is currently split into four large populations in separate range areas: The Pre-Caspian population in Russia northwest of the Caspian Sea, and three populations in Kazakhstan and adjacent areas of Russia and Uzbekistan named Ural, Ustyurt and Betpak-Dala.

Conservation status

The rapid decline of Saiga Antelope numbers throughout the range in the 1990ies has endangered the survival of the species across its range (see section 1.1). The species had been listed as Critically Endangered on the IUCN Red list between 2002 and 2023, when the conservation status was re-assessed as Near Threatened. The improvement in the conservation status was brought about by various conservation measures implemented by Saiga Range States, national and international NGOs and other stakeholders. Since 1995, Saiga has been listed in CITES Appendix II. In 2002, *Saiga tatarica* was included in Appendix II of CMS. The Mongolian species was added in 2008. In 2006, a Memorandum of Understanding concerning Conservation, Restoration and Sustainable Use of the Saiga Antelope (Saiga MOU) signed by all Range States entered into force under CMS. Since then, Meetings of Signatories have been regularly convened by the CMS Secretariat during which conservation actions for all Saiga populations are developed and adopted by the Signatories.

At the national level, the situation differs between Range States. In Mongolia, Russia and Uzbekistan, Saiga is included in the national red books and has therefore a special protection status. Although most of the global Saiga population is found in Kazakhstan, it is not listed in the Red Book there, but special rules have been adopted to grant Saiga a high level of protection and a hunting moratorium was put in place (valid until the end of 2023). While anti-poaching activities are mostly supported by rangers of protected areas in Russia, Uzbekistan and Mongolia, Kazakhstan additionally funds a separate wildlife service, Okhotzooprom, with a group of rangers, whose exclusive responsibility is the protection of Saiga from poaching. These rangers have the right to act outside as well as inside protected areas.

Population size and trends

In Kazakhstan, conservation actions have shown effects in the Betpak-Dala population, the size of which has constantly grown since its lowest level around the year 2003. Although poaching remained a problem, the protection of Saiga was sufficient to bring the population back to a level of estimated 242,500 individuals according to an aerial survey conducted in April 2015. However, in May of the same year, a haemorrhagic septicaemia caused by the bacterium *Pasteurella multocida* led to mass mortality at the calving sites leaving more than 200,000 animals dead (Kock et al., 2018). This was a serious setback for this population, reducing it to only the second largest, globally. However, it has been growing since then and now exceeds the 2015 level with 745,300 estimated in April 2023 (ACBK, 2023). Since 2016, the largest population is the Ural population in western Kazakhstan, which had experienced a mass die-off a few years earlier, but was able to recover quickly and grow steadily at high rates. From 2016 to 2023 it has been able to grow from 70,200 Saiga to estimated 1,130,000 animals, which is the largest size ever recorded in a survey in western Kazakhstan. The condition of the third population in Kazakhstan, the Ustyurt population, has been less positive but is now also improving. While its size decreased for many years despite conservation efforts, leading to a historical low number of about 1,270 animals in

2015 and the widespread expectation that this population could go extinct, numbers have gone upwards since then, with 39,700 estimated in April 2023 (ACBK, 2023).

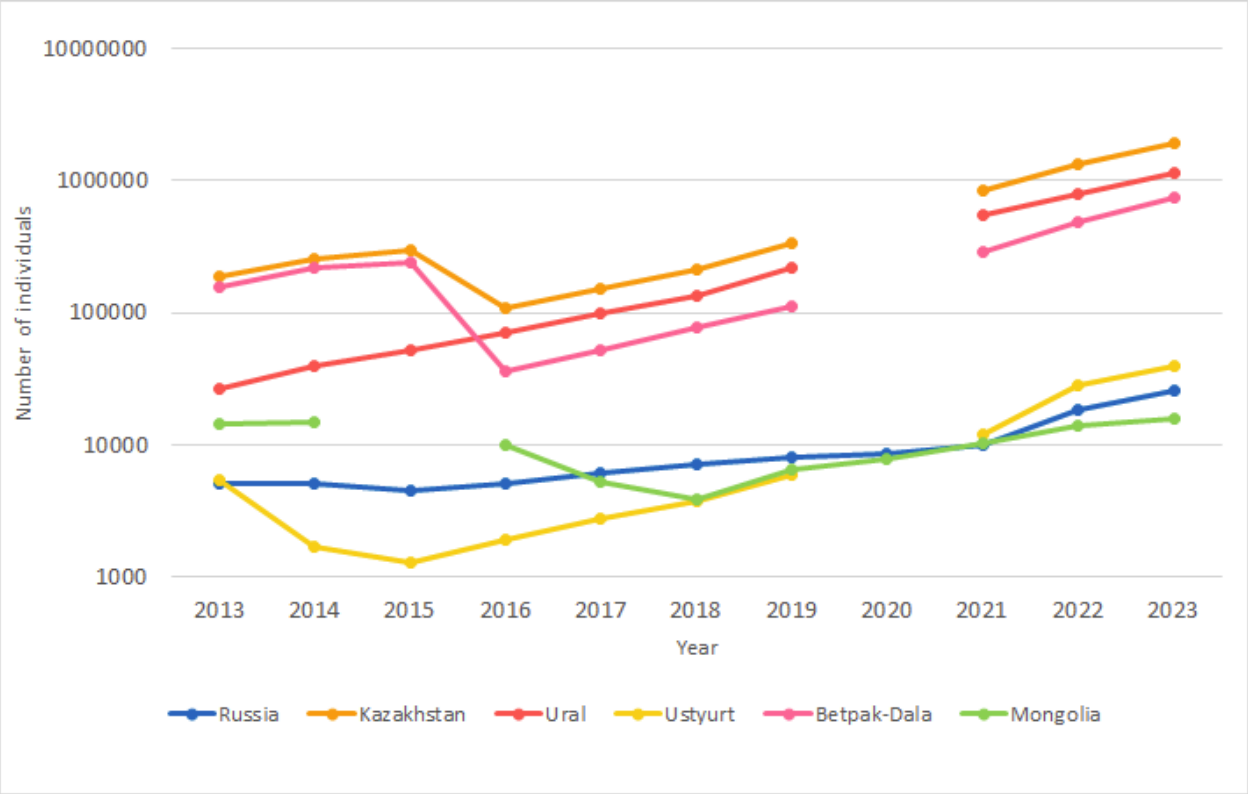

Figure 7: Development of the Saiga population sizes globally for the last 10 years. The vertical axis has a logarithmic scale. The number for Kazakhstan is also shown separately for all three populations. Gaps are due to years without a survey or expert assessment. Sources: Russia: CMS, 2020b; Elista.org, 2022; Rozhnov et al., 2023; Kazakhstan: Institute of Zoology of the Committee of Science, Association for the Conservation of Biodiversity of Kazakhstan; Mongolia: Chimeddorj, 2022; Chimeddorj and Buuveibaatar, 2017; Chimeddorj and Buuveibaatar, 2021; Chimeddorj et al., 2020; WWF Mongolia, 2023.

While the sizes of the main Saiga populations in Kazakhstan are estimated annually based on aerial counts, the Pre-Caspian population in Russia is in most years is roughly assessed from the ground, except for some trials of a drone survey. Its size has stayed at about the same level for many years. However, since 2016 numbers have started to increase slowly and in 2022 have reached a level of roughly 18,500 animals (Elista.org, 2022). In parallel to this development, the proportion of males in the population has increased, which may have contributed to the positive trend in the population size (CMS, 2021). Biologically, the situation of the Saiga in Russia is consequently rather promising if conservation measures are kept at the same level or even extended. The size of available habitat is limited though, which might become a problem at some point.

The status of the Mongolian Saiga is not as positive as the other populations but still gives hope for the future. The population size is not assessed from the air, but only in ground surveys, making resulting numbers not completely comparable and the identification of trends a little more difficult. After promising results of a population survey in 2014 yielding an estimate of 14,000, the population declined and the estimate of the 2016 survey was only 10,000, perhaps due to an increase in poaching after the financing of a local ranger service had ceased. In the winter of 2016/17, the Mongolian population suffered from an outbreak of Peste des petites ruminantes

(PPR) in western Mongolia, which affected livestock as well as wildlife. Several thousand Saiga Antelopes died due to this outbreak. A harsh winter in the following year added even more losses, leaving the Saiga in Mongolia in a rather worrying situation. But the conditions have been better since then and the population has grown again to estimated 15,500 in 2023 (Presentation by Bayarmaa Chuluunbat at SCA meeting, 11.02.2024, Samarkand). This trend might continue in the following years, if not influenced by disease outbreaks or increased poaching pressure.

Threats

Despite these rather positive facts about the status of Saiga Antelopes globally, the species is still threatened by various factors. A major threat for Saigas across all Range States is poaching (CMS, 2021). This is particularly valid for *Saiga tatarica tatarica*, as their numbers allow poachers to obtain a reasonable amount of Saiga or horns. An overview of actually revealed poaching and illegal trade cases is given in Section 2.3.1.

A second, very dangerous threat, which can wipe out thousands of animals in a short period of time, is a disease outbreak (for details see 'Population size and trends' above). That Saiga is prone to mass die-offs, is already known from Soviet times, when several such incidents were documented. In recent history, especially three mass mortalities were significant: two of them happened in Kazakhstan in 2010 with about 12,000 animals dead in the Ural population and in May 2015, when more than 200,000 Saiga of the Betpak-Dala population died in just a few weeks at various locations of the distribution range. The official reason for these die-offs was pasteurellosis, caused by the bacterium *Pasteurella multocida*, likely induced by extraordinary weather conditions, namely high temperatures before and high humidity during the calving period (Kock et al., 2018). And finally, in the winter of 2016/17 several thousand animals- an estimated 70% of the Mongolian population-died due to an outbreak of Peste des petites ruminantes (PPR) (Chimeddorj & Buuveibaatar, 2017). All three cases raised a lot of attention among the public and conservationists. Addressing disease outbreaks is now an important component of conservation programmes for Saiga Antelopes.

A less direct, but still significant threat is habitat loss. Saiga habitat can be lost due to fragmentation (completely or partly) and habitat degradation. The construction of linear infrastructure is a particular problem in all Range States (CMS, 2021). Saiga need large, open spaces without significant barriers to migrate between summer pastures and wintering areas. A road or railway can become an impermeable barrier. Fences for example along roads and railroads and national borders can be particularly long and thus can have devastating effects on habitat connectivity. Several negative examples of infrastructure impeding wildlife movements exist in the region. Planning procedures often do not sufficiently account for impacts on wildlife, as the focus is on economic development. Another factor reducing the habitat available for Saiga antelope is the expansion of the oil and gas industry. Habitat loss from natural resource extraction can be a direct loss through establishment of new mines, drilling sites, and industrial infrastructure, but also through degradation of the habitat, making it unusable for Saiga. Recently the situation has changed for the better, as governments, lending organisations and planners have begun to take wildlife needs into consideration.

A fourth danger for Saiga is the competition for pasture with livestock. This problem is so far known primarily from Mongolia, where the pasture condition is a limiting factor for the development of the Saiga population (CMS, 2021). The weak body condition of Saigas is assumed to have contributed to the mass die-off of Saiga from PPR in 2017. Moreover, herders have a hostile attitude towards the Mongolian Saiga, as they do not derive any tangible benefit from their existence and see their interests harmed by competition for forage with livestock and the

suspected transmission of diseases (Chimeddorj, 2017). Due to the big numbers of Saiga in the Ural and Betpak-Dala populations in Kazakhstan, conflicts with livestock herders and crop growers have been reported. Local villagers complain about too many Saiga feeding on pastures, which are needed for domestic animals, and about Saiga destroying hay-making areas. There are also reports about Saiga from the Ural population, damaging crops on fields in Russia, and Saiga in the Betpak-Dala population causing yield losses on cropping fields in the northern part of the range in central Kazakhstan. Potentially, the direct contact between livestock and Saiga can also lead to disease transmission. These new conflicts currently cause discussions in Kazakhstan about the need to allow hunting Saiga in order to control their numbers. Many stakeholders promote a system similar to the one existing during Soviet times with a state monopoly, but other voices are also heard by decision-makers, and CBWM approaches offer potential especially for conflict mitigation. A solution for a sustainable use of Saiga is currently being developed as part of the implementation of a Strategy for the Conservation and Management of Saiga in Kazakhstan (CMS, 2023).

2.2.2 Argali Sheep

Taxonomy and distribution range

The Argali is a species of wild sheep distributed across Central Asia, inhabiting open landscapes with rolling hills and high mountains with gentle relief. Several subspecies have been described, but the distinction between some of these subspecies and their range areas has not been finally resolved.

The different Argali subspecies are found in the following Range States: Altai Argali *O. a. ammon* in Kazakhstan, Mongolia and Russia; Kazakhstan Argali *O. a. collium* in Kazakhstan; Gobi Argali *O. a. darwini* in China and Mongolia; Tibetan Argali *O.a. hodgsoni* in China; Tian Shan Argali *O. a. karelini* in China, Kyrgyzstan, Kazakhstan and formerly in Uzbekistan; Karatau Argali *O. a. nigrimontanae* in Kazakhstan; Marco Polo sheep or Pamir Argali *O. a. polii* in Afghanistan, China, Kyrgyzstan and Tajikistan; and Severtzov's Argali *O. a. severtzovi* in Kyrgyzstan, Tajikistan and Uzbekistan. The Severtzov's Argali is morphologically and biogeographically as well as in terms of habitat clearly differentiated from the other subspecies. The subspecies North China Argali, Shansi Argali *O. a. jubata* occurred in China but is considered extinct (Harris et al. 2009).

Conservation status

The species is assessed as Near Threatened in the IUCN Red List, "because this species is believed to be in significant decline (but probably at a rate of less than, but approaching, 30% over three generations, taken at 24 years) due to poaching and competition with livestock, likely exacerbated by the impact of ongoing climate change" (Reading et al., 2020a). Since the late 1980s, Argali has been legally protected in all Range States (in Tajikistan since 1987; Fedosenko & Lushchekina, 2005) and is included in national Red Books, although hunting is not completely banned in some countries.

The Argali is protected by international treaties. The Argali is listed on CMS Appendix II and an International Single Species Action Plan for its conservation was elaborated and adopted in 2014 (Mallon et al, 2014). It is also listed on CITES Appendix II, putting international trade in Argali specimen under control. The European Union applies stricter control measures and requires import permits for Argali trophies. The US Endangered Species Act lists Argali as endangered, except in Mongolia, Kyrgyzstan, and Tajikistan, where they are listed as threatened. Threatened

classification allows for importation of trophies from legally taken Argali in those countries under specifically authorized permits from the U.S. Fish and Wildlife Service. Permits for importation of trophies are generally not authorized for taxa listed as Endangered. Due to the regulation by the Government of Kyrgyzstan from the 1990s allowing only hunting of O. a. polii, the importation of Argali trophies which may belong to O. a. karelini from Kyrgyzstan into the US would not be permitted, which causes substantial problems for sustainable hunting of Argali in the country given the uncertainty with regard to which subspecies are present in the country.

Population size and trends

Information on population sizes is presented in the IUCN Red List assessment (Reading et al. 2020a). Numbers provided by Mallon et al. (2014) suggested a total number of about 107,000 Argali, but the population information in the IUCN Red List assessment suggests a substantially lower number. Available figures are of varying reliability and refer to different spatial and temporal scales. The population trend is assessed as decreasing, apparent increases in numbers are likely mainly due to more intensive surveys in some areas.

More recent country-wide reliable population estimates are difficult to obtain. For five countries of Central Asia population sizes are presented in Table 2. These figures must be treated with caution as they do not refer to surveys, for which documentation is publicly available. Typically, such figures rely on the compilation of numbers reported by protected area administrations and by holders of wildlife management areas.

Table 2: Recent population numbers for Argali Sheep in five Central Asian countries.

Country	Region	Number	Year	Source
Kazakhstan	All	16,451	2021	Committee for Forestry and Wildlife 2022
Incl.:	*O. a. ammon* range	none		
	O. a. collium range	13,083		
	O. a. karelini range	2,657		
	O. a. nigrimontanae range	711		
Kyrgyzstan	All, only GMA	15,507	2021	National Statistics Committee 2022
Kyrgyzstan	All incl. unallocated areas	22,304	2021	Department for Biodiversity Conservation and Protected Areas 2022
Mongolia	Country-wide	17,903-26,155	2009	Reading et al., 2020 referring to different estimates
Tajikistan	E-Pamirs, GMA	26,500	2018	USFWS 2022
Uzbekistan	Nuratau SNR	1,474 (spring) 1,350 (fall)	2022	Beshko, pers. comm. 2022

The Committee for Forestry and Wildlife of Kazakhstan reported data on four subspecies of Argali and additionally on Transcaspian Urial *Ovis vignei arkal*, summarizing these taxa as mountain sheep (Abdrakhmanov, pers. comm. 2022). In Table 2, the Urial is not included in the overall number. The provided numbers suggest a continuous, albeit biologically not impossible, increase

of the population sizes of three Argali subspecies, while *O. a. ammon*, occurring in the Altay mountains almost entirely outside of Kazakhstan, has been declining and possibly disappeared.

The report by the Department for Biodiversity Conservation and Protected Areas (2022) of the Kyrgyz Republic recognises three subspecies for the country: Tien Shan Argali *O. a. karelini*, Marco Polo or Pamir Argali *O. a. polii* and Severtzov's Argali *O. a. severtzovi*. For 2021 the report states a number of 69 Severtzov's Argali in the Batken region. Given the extreme rarity of this Argali subspecies outside of its remaining core range area in the Nuratau Strict Nature Reserve of Uzbekistan, the occurrence in Kyrgyzstan is of high conservation significance. The presence of the subspecies in this part of the Ferghana valley has also been confirmed in Uzbekistan in 2022 (Beshko, pers. comm. 2022).

Figure 8: O. a. collium in wildlife management area "Severo-vostochnoe"; Karaganda region, Kazakhstan, 2018. Photo: Michel.

Differentiation between Tien Shan Argali and Marco Polo Argali has been subject to scientific and legal debates since the beginning of international hunting tourism in Kyrgyzstan in the 1990s. Some scientists, e.g., Davletbakov (pers. comm. 2010-2021) suggest that Marco Polo Argali is restricted to the southernmost parts of the country and occurs only in low numbers, while the majority of the Argali population belongs to Tien Shan Argali, which accordingly is not threatened, but stable in numbers. However, the Government of the Kyrgyz Republic in the early 1990s considered Tien Shan Argali to exist in only low numbers in small areas in the Ysyk-Kol and Naryn regions.

The numbers for Uzbekistan refer only to surveys inside Nuratau Strict Nature Reserve and the reported numbers are the directly observed animals on survey transects. Extrapolating these would yield a population estimate of more than 2,219 in spring 2022 and 2,272 in fall. The lack of substantial increase from spring to fall can be explained by lower detectability in fall and by

weather conditions during the survey. Camera trap records documented large herds and good reproductive success. Outside the protected area numbers are low (Beshko, pers. comm. 2022).

For Mongolia the most recent information available was provided by Reading et al. (2020) for estimates based on surveys in 2009 as well as opinion-based guesses about regionally differing trends and overall decline. Reportedly, Argali continue to decline in western and central Mongolia, while populations in eastern Mongolia appear to be expanding. Argali populations in southern Mongolia appear to be relatively stable.

The numbers reported for Argali by the other four Range States above all suggest stable and even growing populations. However, as these numbers are reported by protected areas and hunting area managers and then compiled by agencies, which are in charge of the management of these populations, there is a high risk that reported numbers and trends are positively biased. Contrary to this potential overly positive reporting, some NGOs and individual experts – mainly those opposed to legal hunting – have occasionally declared dramatically low and continuously declining numbers, which were much below the numbers confirmed by the results of surveys with involvement of independent experts from national and international scientific institutions and IUCN.

Threats

The main threats are poaching (for meat), pasture competition, displacement possibly disease transmission by domestic livestock, and habitat loss. These threats appear to vary little among Argali populations, even though habitats differ. In general, Argali are extremely intolerant of human disturbance (Fedosenko 1999; Namgail 2004; Maroney 2006; Namgail et al. 2007; Harris 2007; Schaller and Kang 2008). In landscapes with the presence of livestock and herders, Argali are typically missing. Larger subpopulations of Argali are mainly limited to areas with high levels of active protection (few protected areas, some hunting concessions and mining areas) and/or locations that are remote and difficult to access. For instance, Khanyari and colleagues (2020) estimated Argali density in Sarychat-Ertash Strict Nature Reserve (Kyrgyzstan) at 2.26 individuals per km² (95% CI 1.47–3.52), but in the neighbouring Koiluu valley used for livestock grazing no Argali were recorded. While competition with livestock for scarce forage is certainly a limiting factor for Argali numbers, their total absence from many areas with suitable habitat is most likely caused by poaching and related disturbance as well as harassment by herders' dogs. Where poaching is prevented, Argali can coexist with livestock as was observed in several community-run wildlife management areas. Exceptional observations in areas without poaching and disturbance by livestock and dogs, suggest that Argali can become habituated to human presence (see Young et al., 2011), e.g., at the Kumtor Gold Mine and Sarychat Ertash Strictly Protected Area.

International border fences present a barrier to movement and dispersal of Argali, prevent access to optimal seasonal grazing sites and increase fragmentation and genetic isolation (Luikart et al. 2011; Rosen 2012; Mallon et al. 2014; Ali et al. 2017).

Legal protection and use

In all Central Asian countries, the take of Red Book species like Argali, although in principle prohibited, can be allowed by decisions of the government. Based on such decisions, annual quotas for hunting tourism are issued in Kyrgyzstan (annually around 100), Mongolia (varying year by year), Tajikistan (110 during season 2019/2020; USFWS, 2022) and Uzbekistan (annually up to six), while in Kazakhstan similar decisions about Argali are under consideration. These

quotas are conservative, given the reported overall numbers, and legal hunting is certainly no direct driver of declines or reason for locally low population size.

2.2.3 Snow Leopard

Taxonomy and distribution range

The Snow Leopard *Panthera uncia* is the smallest of the large cats of the genus Panthera and was previously assigned to a separate genus Uncia. Genetic phylogeny (Davis et al. 2010) found that the Snow Leopard's closest relative is the Tiger *Panthera tigris* from what it diverged between 2.7 and 3.7 million years ago. There are no broadly recognized subspecies due to the high connectivity within the Snow Leopard's range and the species' high ability to travel across large distances also traversing areas with unsuitable habitat.

The Snow Leopard is distributed across 12 Range States in Central Asia (Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan and Uzbekistan). Suitable habitats are mountains of elevations from 600 to 4,000 m in the northern part of their distribution to 2,500–5,800 m in the southern part Typically, snow leopards occur in largely tree-less areas with rocky sections, but sometimes also in open forest and woodland habitats.

Conservation status

Since 2017 the IUCN Red List assesses the status of the Snow Leopard as Vulnerable (VU); previously it had been listened as Near Threatened (NT). The authors considered the previous assessment from 2008 as incorrect, and thus the change of the status in 2017 was not a genuine change in the species status, but an assessment correction (McCarthy et al., 2017). The assessment as well as the assumed population figures have been challenged, but the status remains unchanged as no estimate of global population size is available, which would warrant a higher risk category in accordance with the criteria of the IUCN Red List.

The Snow Leopard is legally protected in all Range States. The species is listed on CITES Appendix I and on CMS Appendix I. No legal hunting has been permitted during the last two decades. The most recent legal hunting took place in Mongolia in the early 1990s.

Population size and trends

A population estimate for Mongolia (Bayandonoi et al., 2021), based on systematic stratified surveys, preliminarily yielded a population size of 953 (95% confidence interval: 806-1,127) adult Snow Leopards across Mongolia's entire Snow Leopard habitat of 326,617 km². Unfortunately, such estimates of Snow Leopard populations are not available for other range states.

McCarthy and colleagues (2017) quoted country reports with 100-120 Snow Leopards being mentioned for Kazakhstan, 300-350 or 350-400 for Kyrgyzstan, 250-280 for Tajikistan and 30-50 or 80-120 for Uzbekistan. The differences in numbers are likely due to different reference years. In Kazakhstan, the recent estimates (2021) of the Institute of Zoology (Almaty) resulted in 140-180 animals (Central Communications Service, 2022); in 2014 their number was estimated as 110-130 animals (Mallon and Kulikov, 2015). In Tajikistan, Sokov (1971) assumed a population

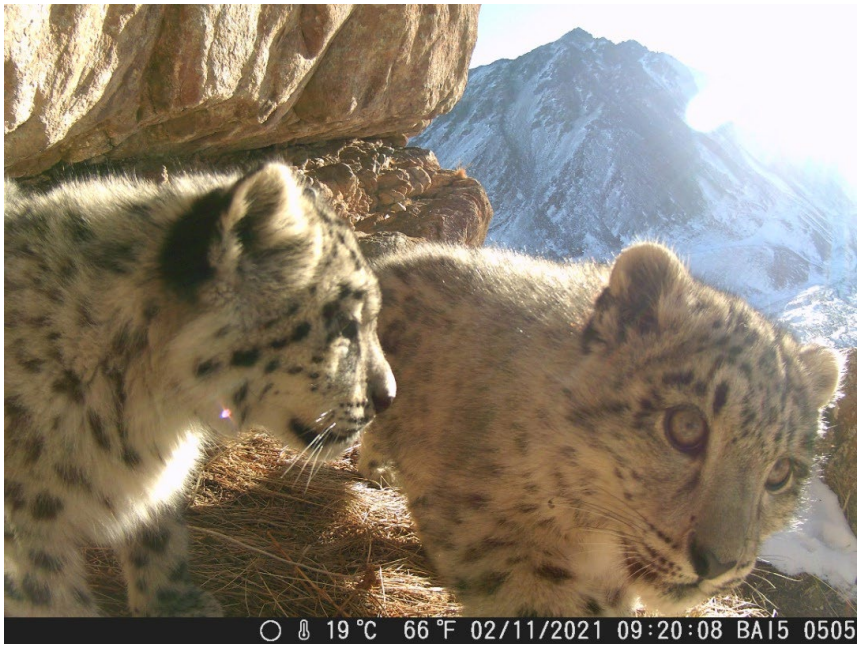

Figure 9: Snow Leopard cubs in Baiboosun, Kyrgyzstan. Photo: Akmatov

size of about 1,000 Snow Leopards during the mid-1960s, while the most recent issue of the Red Book of Tajikistan from 2015 provided a guess of 250 animals for the country. The current draft of the National Snow Leopard Conservation Action Plan (Government of the Republic of Tajikistan, 2022) contains an assumed population size of 500 Snow Leopards. However, as with other countries, no country-wide systematic population study is available, and local population densities vary substantially, making an estimate for larger areas highly uncertain.

Given the high uncertainty about past and current numbers, establishing population trends for the species is challenging. McCarthy et al. (2017) suggested that numbers are reportedly stable or modestly increasing in some areas but are likely to be declining in others. Recent localized extinctions may have occurred in some areas of the former Soviet Union. Evidence of increased or re-established populations may in some cases be a consequence of enhanced survey effort in previously not surveyed areas, although conservation actions and policies were also likely to have had an effect.

Threats

The main drivers of Snow Leopard decline are illegal killings, both targeted poaching and resulting from conflict with livestock herders, and shortage of wild prey, which is under pressure through poaching, competition with livestock as well as habitat degradation caused by livestock. Camera trap data suggest that in many areas dispersing male Snow Leopards are regularly occurring, but encounters of reproductive females are much more limited (Lukarevski, pers. comm. around 2015; ANCOT, unpubl. data; Ilbirs, unpubl. data). Beyond possible bias in detection rates, potentially caused by lower mobility of reproducing females, the reason for real absence might be that females tend to disperse less than males and are less likely to recolonize areas from which Snow Leopards had disappeared. Furthermore, females with dependent young hunt in comparably smaller areas and therefore require a higher prey density. Low prey population density may affect habitat suitability for them, and consequently reproductive success.

2.2.4 Bukhara Deer

Taxonomy and distribution range

Bukhara Deer was until recently considered a subspecies of the European Red Deer *Cervus elaphus*. The IUCN Red List in 2017 for the first time assessed it as a separate species *Cervus hanglu*, including Bukhara Deer *C. h. bactrianus* together with Hangul *C. h. hanglu* and Tarim Deer *C. h. yarkandensis*. The Bukhara Deer is restricted to the riparian areas and adjacent semi-desert and desert along the Amu Darya, Syr Darya, Zarafshan and Ili Rivers. Autochthonous populations had survived only in few sections of the first of these river basins, while in all other areas Bukhara Deer populations have been reintroduced during the second half of the 20th and during the 21st centuries.

Conservation status

In the most recent IUCN Red List assessment, the entire species *Cervus hanglu* was assessed as Least Concern (LC), justified by an increasing population of 2,000 – 2,500 mature individuals with the extent of occurrence (EOO) at >1,000,000 km² and its area of occupancy (AOO) not known, but unlikely to approach the qualifying threshold of less than 2,000 km² for the IUCN Red List status of Vulnerable (Brook et al., 2017a).

Given that the total population and known AOO of *Cervus hanglu* are close to the thresholds for EN and VU, the species might possibly be assigned to the category Near-Threatened (NT) in the future. The subspecies Bukhara Deer appears to qualify for the category Near-Threatened, while for *C. h. yarkandensis* a higher risk category may apply and *C. h. hanglu* has already been assessed as a Critically Endangered subspecies (Brook et al., 2017b).

Population size and trends

The latest Bukhara Deer Overview Report (CMS, 2020a) based on National Reports by the Range States and experts' assessments states that the overall population number is stable and increasing. But population numbers and trends vary between the different isolated sites of occurrence (CMS, 2020a). The report provides the following figures for national population sizes of the subspecies (including immature individuals and fenced groups):

Kazakhstan:	>900 individuals – increasing
Tajikistan:	>500 individuals – stable/increasing
Turkmenistan:	~250 individuals – stable/slightly increasing
Uzbekistan:	>2,000 individuals – increasing, with overpopulation in Baday-Tugay causing degradation of the ecosystem and the population itself
Total:	3,735 – 3,900 individuals

The largest population currently exists in Uzbekistan, in the Baday-Tugay section of the Lower Amu Darya Biosphere Reserve. A survey in 2019 yielded an estimated density of 24 deer per km² and a population estimate of 2,112 (95% CI: 1,320-3,344), which indicates a significant growth from around 100 animals in 1999. The authors consider this population size as incompatible with the conservation of the riparian woodland ecosystem they inhabit and with coexistence with local land users (Cornelis et al., 2020). This is a situation which may threaten the sustainability of this population, with a risk that either natural processes (e.g. density-related increase in mortality

Figure 10: Bukhara Deer in the Zeravshan valley, Tajikistan. Photo: Michel

and/or reduction of reproduction) or increased poaching could cause a substantial reduction of the Bukhara Deer population in this area. Likely an important contributing factor is the limited mobility of the Deer, probably due to a combination of physical barriers caused by anthropogenic landscape changes, poaching/disturbance and/or behavioural traditions in the population caused by its history linked to reintroduction and other factors. Other populations in Uzbekistan are either stagnating or growing only slowly, but any well-protected isolated population of Bukhara Deer may face similar problems in the future.

In Kazakhstan, the species had disappeared completely by 1956. In 1981, 22 Bukhara Deer were brought to the Karachingil hunting area of the Cabinet of Ministries in the Ily-river valley. The species therefore occurs only in semi-captive and reintroduced populations. In 1999, the population size was assessed at 80 individuals. In 2021, the semi-captive population in the fenced wildlife management area Karachingil officially numbered 605 animals with another 80 animals free-ranging outside the fence, indicating a strong growth in recent decades. No information is available if this population is currently managed for stabilizing its numbers. Since 2002, a reintroduction programme began in the Syr Darya river valley (Turkestan forestry), using the Deer from Karachingil. In 2020, numbers there reached about 150 Bukhara Deer. Since 2020, translocations from Karachingil to the Ile-Balkhash State Nature Reserve, near the Ile river delta (southern Balkhash), started and now there are more than 100 deer living in the area.

In Tajikistan, Beshai Palangon Strict Nature Reserve (formerly known as Tigrovaya balka) hosts the largest native population of Bukhara Deer, which is of utmost importance for the genetic integrity of the subspecies despite having experienced past severe declines and possible genetic bottlenecks as well as being represented in most or all reintroduced populations. This population has been continuously growing since a population low in the 1990s, and similar challenges as reported above for Uzbekistan's Baday-Tugay area may arise in the near future. The population size has been estimated at 150 individuals in 2010 and at 350 animals in 2019, showing a clearly positive trend. Dispersal along the Panj river so far appears to be limited. Despite the occurrence of Bukhara Deer in the riparian areas upstream up to Dashtijum Strict Nature Reserve (also spelled as Dashti-Dzhum in older literature) no larger population has established itself yet, possibly due to limited available habitat and poaching, in particular in the riparian areas in

Afghanistan. A smaller and stable or slowly growing reintroduced population exists in the Zarafshan valley and is transboundary with Uzbekistan. In this valley, the reclamation of riparian areas for agriculture in combination with related anthropogenic changes of the river dynamics recently caused large losses of suitable habitat (Michel, unpubl. report 2018).

Threats

The natural habitat of Bukhara Deer, the riparian (tugai) forest is shrinking due to human activities. Manipulations of riparian dynamics for reclamation or protection of agricultural lands and gravel extraction cause direct and indirect losses of actual and potential habitat in parts of the range. Even within its natural habitat and in protected areas, man-made barriers to migration prevent recolonization, for example in the Lower Amu Darya Nature Reserve in Uzbekistan (CMS, 2020a). While the extent of suitable riparian habitat and fragmentation of habitats and populations appear to be the most significant limiting factors, poaching and related disturbance may affect population growth and limit the ability of the Deer to disperse especially beyond protected areas.

Legal protection and use

Bukhara Deer is currently legally protected in all range states. It is listed in Appendices I and II of CMS as "*Cervus elaphus yarkandensis* (populations in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and Afghanistan)" in line with Wilson and Reeder (2005). The listing on CMS Appendix I requires its legal protection from taking, and on Appendix II, which provides for the conclusion of international agreements for transboundary conservation. International Conservation actions are agreed in the framework of the Memorandum of Understanding concerning the Conservation and Restoration of the Bukhara Deer under CMS (Bukhara Deer MOU). No hunting permits have been issued for Bukhara Deer until recently and only exceptional live captures for translocations and reintroductions were permitted. In 2022 first importation of a hunting trophy of wild origin from Uzbekistan to Russia is documented in the CITES trade data base and in early 2024 a hunting tourist from the US hunted a Bukhara Deer in Uzbekistan.

2.3 Extent, causes and effects of poaching on focal species

All focal species of this study are threatened by illegal hunting, but the scale, actors involved and triggers as well as direct and indirect effects differ between the species significantly. This section describes the problem of wildlife poaching in Central Asia, attempting to estimate its effects on each focal species. Current measures in place are described and the potential of CBWM to reduce poaching pressure is estimated.

2.3.1 Saiga Antelope

Scale of poaching

In the 1990ies Saiga poaching had been so intensive that it decimated 95% of the population (see Section 1.1). After the resulting collapse of the Saiga populations, the extent of poaching also decreased because the expected profits from illegal horn trade dropped significantly due to low animal densities, while the risk of getting caught increased due to strengthened protection

measures (Kühl et al., 2009). Therefore, poaching by organized, criminal groups for illegal trade had largely ceased when Saiga populations were low, but is currently an issue again.

Every year numerous incidents of poaching are recorded, and illegal Saiga products destined to China and Southeast Asia are confiscated (Tengrinews, 2022b; Tengrinews, 2022c). For instance, Kazakhstan and Russia have reported cases of poaching and confiscations to the CMS Secretariat under the Saiga MOU from 2016 until 2020. Although numbers vary from year to year, the records remain more or less at the same level showing clearly that poaching remains a significant threat to Saiga (Figure 11). A similar stable trend is observed in the numbers of confiscated Saiga horns with even increasing numbers for Russia. The number of confiscated Saiga corpses increases in Kazakhstan towards the end of the reporting period. The high numbers of confiscated horns compared to Saiga corpses suggests that only a fraction of poaching cases is detected and reportedFigure 11.

Effects of poaching for Saiga

Poaching for commercial reasons has historically had a major impact on Saiga populations. The illegal killing of primarily males for their horns was the main cause of the dramatic population decline of Saiga observed in 1990ies, leaving only estimated 5% of the former population size across its range. In order to allow the population to recover, conservation measures were put in place, both nationally and internationally (see Section 2.2.1; Howe et al. 2011).

Poaching is still today a major threat to the species, although intensive anti-poaching activities keep it at a level which allows Saiga population growth and a recovery of populations.

Reasons for poaching

The reasons for poaching are manifold and vary between Range States (CMS, 2021). The highest losses of Saiga are caused by organised, criminal groups, who exclusively aim to get the horns of males mainly destined for export to China and southeast Asia. Another type of poaching is sometimes practiced by local people living within Saiga range with the aim to get meat for own consumption or for sale. Such local poachers usually do not target only males, but will try to sell horns only if they get the chance to shoot a male animal. The motivations for poaching can be: economic problems and unemployment, hunting as a hobby, or using Saiga as an alternative to slaughtering own livestock. Opportunistic poaching is likely wide-spread, as local people might shoot an occasionally seen Saiga while looking after their own cattle, for example. Such poaching can happen also where Saiga numbers are very low, thus posing a serious threat to the survival of small populations. The third type of hunters are people from larger towns, typically located outside the Saiga range, who illegally shoot Saiga as a kind of sport hunting or for entertainment. However, such hunters likely have the smallest impact on the Saiga population. Official numbers of poached animals need to be interpreted carefully as many cases seem to stay undetected.

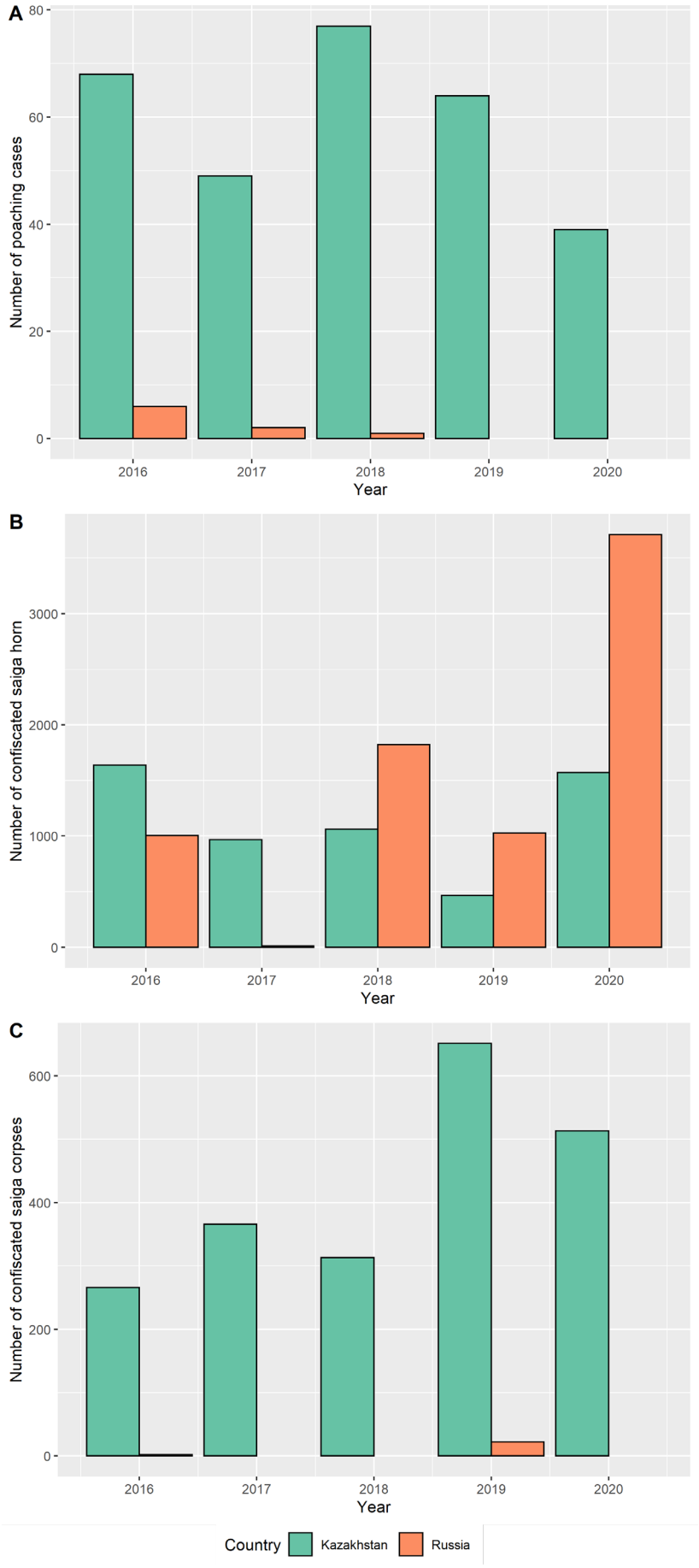

Figure 11: Numbers of registered cases of illegal hunting and trade of Saiga in Kazakhstan and Russia from 2016 to 2020. A: Number of registered poaching cases.
B: Number of confiscated Saiga horn.
C: Number of confiscated Saiga corpses.

(Data for Kazakhstan for 2020 representing only 6 months.)

Source: National reports to the CMS (CMS, 2020b; CMS, 2020c).

2.3.2 Argali

Scale of poaching

Available evidence suggests that Argali continue to be subject to intense poaching pressure despite formal protection. Some reports of Argali poaching are available. For example, poaching cases are regularly reported in Kazakhstan. Statistics of detected poaching cases and deterred poachers are not readily available, because systematic records are lacking. An accurate monitoring of the Argali population and poaching cases is difficult, as most Argali inhabit remote areas, making surveillance and enforcement challenging. Indirect evidence is often used to derive the level of poaching.

Figure 12: Case of recent Argali poaching in Almaty region in southeastern Kazakhstan (source: https://ohotniki.kz/articles/brakonerstvo/2020-brakonerov-s-myasom-arkhara-zaderzhali-politsejskie-almatinskoj-oblasti).

Figure 133: Confiscated firearms and skulls of Argali in a hunting concession in the Eastern Pamirs, Tajikistan, 2009. Photo: Michel

Effects of poaching for Argali

For reasons outlined above, the impact of poaching on Argali populations is difficult to assess. Therefore, we will attempt to discuss the extent of Argali poaching based on local reports and indirect indicators.

Argali numbers can increase within a few years, when poaching is stopped. For example, after the establishment of protection by a local community-based group in 2013 in Northern Alichur (Eastern Pamirs of Tajikistan), Argali numbers increased from 106 (December 2012) to 577 (December 2018) (ANCOT, unpubl. information 2019). In Kazakhstan, the number of Argali in the freshly established Karatau Strict Nature Reserve (2004) was 38 animals, and in 2021 it was more than 300. Therefore, decreasing or stagnating populations in otherwise suitable habitat are likely caused by poaching. For instance, surveys in September 2013 in two ecologically comparable sites in Tajikistan yielded estimates of only 0.01 Argali and 0.7 Ibex per km² in an unmanaged area, but of 2.7 Argali and 0.9 Ibex per km² in a nearby located hunting concession, where anti-poaching measures were in place (Michel & Rosen, 2024). In Uzbekistan the Argali population in the Nuratau range is almost entirely restricted to the Strict Nature Reserve. Outside of the protected area, Argali occur only occasionally (own observations, Beshko, pers. comm. 2016).

Poaching and hunting can have a substantial influence on the behaviour of Argali, depending on the intensity and applied methods. Argali tend to keep a large distance from humans and livestock in areas, where poaching occurs and/or livestock is protected by dogs. In hunting concessions, where vehicles are used for approaching Argali during the hunts, the animals flee from vehicles.

But in the absence of poaching and where livestock is free-ranging or herded without dogs, Argali can become habituated to presence of people and domestic animals and even share pastures

with them (Figure 14). In the area of Kumtor gold mine in Kyrgyzstan, where a strong ban on hunting has been enforced, Argali are sometimes observed grazing a few meters off the dirt roads used by heavy mining machinery and workers (Davletbakov, pers. comm. 2015). Similarly, it was observed that Argali in Sarychat-Ertash strict nature reserve in Kyrgyzstan and in Ikh Nart reserve in Mongolia became habituated to the presence of researchers and came close to their camps (Figure 15; Kulenbekov, pers. comm. 2015; Reading, pers. comm, around 2010).

Figure 14: Yak and Argali jointly grazing. South-eastern Pamirs, Tajikistan. Photo: Bekmurodov.

Figure 15: Habituated Argali in Sarychat-Ertash Strict Nature Reserve, indicating absence of poaching. Photo: Gilbert.

Reasons for poaching

Illegal hunting by local people can occur for subsistence, for commercial reasons, and in some cases as sport and even as revenge for feeling excluded from perceived legitimate resource use. For Argali poaching, however, subsistence or income generation are not likely to be the main drivers. This is because hunting Argali usually requires covering long distances by foot or on horseback in a difficult terrain. Poaching of Argali is likely driven by a demand for trophies, as a demonstration of power or fitness of the hunter.

In some cases, particular proximity between people and Argali makes the animals an easy victim of poaching. For example, Argali habitat is often located close to national borders, making the animals easily accessible for armed personnel. Cases when armed officials engaged in poaching activities of Argali have been observed across Central Asia (various pers. comm. to Michel, 1993 – 2022).

Informal information suggests that in Kazakhstan some hunting concessions that protect Asiatic Ibex as valuable game species for foreign clients may tolerate or even practice poaching of Argali, which is formally protected due to its listing in the national Red Book, thus not having any legal commercial value for hunting tourism (Levitin, pers. comm. 2018).

16Illegal trophy hunts have been reported from various parts of the Argali range area, although in many cases it is difficult to obtain full evidence. For example, in April 2017, Kyrgyz customs at the border with Tajikistan seized a party of trophies including seven Marco Polo Sheep trophies which were going to be shipped to European hunting clients (National Explorer, 2017). An import permit was missing, and a falsified hunting permit was part of the accompanying documentation.

Where hunting of Argali is legal, violation of the hunting rules undermines the efforts to ensure sustainability of use. Hunts outside of the assigned areas and even in strictly protected areas, where all hunting is banned, as well as outside of the official hunting season are known. Cases of Argali hunts by foreigners in strictly protected areas have been reported from Kyrgyzstan and Tajikistan. In Tajikistan's Zorkul Strictly Protected Area even an illegal hunting camp has been discovered in 2010.

Given the strong competition in the legal wild sheep hunting market and the desire for "record" trophies, there have been allegations of manipulated trophies supported by photographic materials. These manipulated trophies may be composed of horns of more than one ram. Additional animals shot to produce such trophies may be unaccounted for in respective permits and documentation. In addition, manipulated trophies would potentially blur the real conditions of the hunted population, hiding declining horn size as an indicator of overhunting. Such declines in horn size may either show that too few rams reach old age or that horn size of rams has a generally decreasing tendency due to the negative selection. Furthermore, any illegal and unethical practices undermine the reputation of legal hunting, can trigger trophy import bans and other negative economic, social and conservation consequences as well as encourage poaching in general.

2.3.3 Snow Leopard

Scale of poaching

Nowell et al. (2016) assessed the scale of Snow Leopard poaching and illegal trade across the species' Range States. Based on expert interviews they estimated that 221-450 Snow Leopards have been poached annually between 2008 and 2016. It is estimated that at least a similar number of animals continues to be poached also beyond this period. (SLT, 2024).

Much of the poaching goes undetected. From Kazakhstan little information is available about the poaching of Snow Leopards, with only five observations since 2003 and no known seizures, although informal reports and low Snow Leopard numbers despite suitable habitat indicate ongoing poaching (Nowell et al., 2016). In Kyrgyzstan, poaching and trade have declined since the 1990s, when poaching was estimated at 90-120 animals per year (Koshkarev and Vrypaev, 2000). Sixteen Snow Leopards were seized between 2000-2002 by an anti-poaching unit "Grupa Bars" established by the German NGO NABU. Detections of poaching cases and seizures for 2003-2016 totalled just 14 Snow Leopards (Nowell et al., 2016).

The real number is probably higher. A research team attempting to collar Snow Leopards outside of protected areas in the Inner Tien Shan Mountain area found very few signs of Snow Leopard presence despite suitable habitat and available prey but detected several leghold traps, suggesting rampant poaching (Kachel, pers. comm. 2014). For Tajikistan, an annual number of 20-25 poached Snow Leopards was estimated, with 10 potentially entering illegal trade, while eight seizures occurred between 2010 and 2016 (Nowell et al., 2016).

Effects of poaching for Snow Leopard

Illegal killing of Snow Leopards is likely to be a major driver of population decline (Nowell et al. 2016). Snow Leopards as apex predators have a naturally low reproduction rate and are rarely killed by other predators (Mallon & McCarthy, 2024). Given the scale of poaching and the total number of animals ranging in a few thousand individuals, it can safely be assumed that any additional human-caused mortality poses a threat to the survival of the species.

Local populations can become threatened quickly if reproducing females are poached. While males are able to disperse over large distances, females are typically less mobile, and tend to settle close to the mother's home range. Therefore, the loss of reproducing females is not easily compensated for and can lead to local extinctions, especially in poorly connected parts of the range, where human-made or natural barriers to dispersal exist (V. Lukarevskiy, pers. comm. to S. Michel 2015). In addition, reproducing females need higher prey densities in their habitat than males. Therefore, poaching of prey species can have a profound negative impact on Snow Leopard's reproductive success (Mallon & McCarthy, 2024).

Reasons for poaching

Most killings of Snow Leopards occur in retaliation of livestock depredation or for the purpose of illegal trade (Table 3). When Snow Leopards enter poorly secured barns or corrals, they often get trapped in these structures, kill many or all of the livestock present in the structure and are caught by the herder. In such cases livestock owners may try to compensate for their losses by selling the Snow Leopard – alive or dead – or its body parts valued on the illegal market (Figure 16). Experts estimate that 60% of retaliatory and non-targeted poaching incidents result in the attempt to sell the animal (Nowell et al., 2016).

Table 3: Ranking of threats related to the direct killing and removal of Snow Leopards by Range State. Source: SLN (2014) quoted by Nowell et al. 2016. Higher numbers indicate severity of perceived threat: High (red, 11-15); Medium (orange, 6-10); Low (yellow, 1-5); Not a threat (white, 0).

Direct Killing and Removal of Snow Leopards	Afghanistan	Bhutan	China	India	Mongolia	Nepal	Pakistan	Russia	Kyrgyz Republic	Kazakhstan	Tajikistan	Uzbekistan	Mean value
In retribution for livestock depredation	**13**	6	10	8	**11**	**12**	**14**	8	6	**12**	8	8	9.7
Poaching for trade in hides or bones	9	6	8	6	6	9	**12**	10	**15**	11	11	9	9.3
Zoo and museum collection of live animals	0	0	0	0	0	6	0	0	2	3	3	5	1.1
Traditional hunting of Snow Leopards	0	3	3	0	4	3	0	0	0	6	1	9	2.4
Secondary poisoning and trapping of Snow Leopards	3	7	6	6	7	9	6	**14**	9	10	4	0	6.7

Figure 17: Skin of Snow Leopard offered for sale in Tajikistan. Photo: Anon. 2009.

Between 2012 and 2020, 60 attacks of Snow Leopards on livestock were reported in Tajikistan, accounting for a total loss of at least 950 sheep and goats (UNEP & GRIDArendal 2020). Some Snow Leopards have been repeatedly caught after livestock depredation and released later, in some cases after translocation. Since 2021 an enclosure for confiscated Snow Leopards or those captured in barns is operated by a hunting concessionaire on behalf of or in cooperation with the state nature protection authorities (Asia-Plus, 2021). It is unclear what happens later to these animals. Reportedly at least one such Snow Leopard has been transferred to the Sayano-Shushenskiy Nature Reserve in Russia for population restocking.

In Kazakhstan, according to unofficial data, in 2010-2018 about 8-10 skins of Snow Leopard were processed annually in taxidermy workshops in Almaty, but they originated from Kyrgyzstan. In the last years (since 2019-2020) no skins were reported in the city, which might be due to better protection in Kyrgyzstan. More evidence for Snow Leopard poaching by local people with the purpose of illegal trade exists from Kyrgyzstan, where several cases of unsuccessful attempts of illegal trade in Snow Leopard parts have been reported in the media between 2020 and 2022 (kloop, 2020; kloop 2021; kabar 2022a; kabar 2022b; Sputnik.kg, 2022).

Illegal trophy hunts of Snow Leopards and capture of live Snow Leopards for staged illegal hunts (a previously caught Snow Leopard is released to be shot by a well-paying hunter) have been reported several times, in particular from Tajikistan. The market for such illegal hunts and thus their direct impact on the population appears very limited, but it can cause the perception by local poachers that Snow Leopards can be sold for this purpose and may motivate trapping. One of the few known cases was the photograph of a businessman from Russia with a dead Snow Leopard appearing on social media in 2015, although neither time nor location of the alleged killing could ever be established (UNEP & GRIDArendal, 2020; Figure 17).

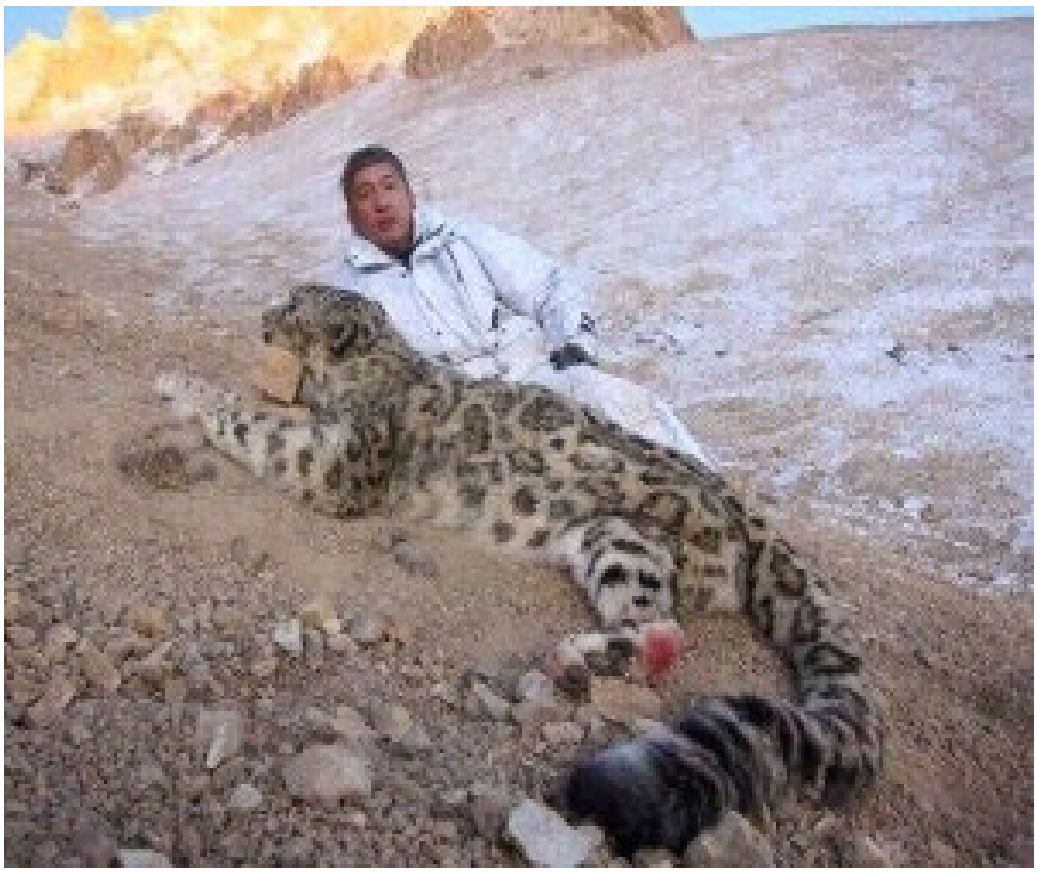

Figure 18: Russian businessman Pavel Te and a Snow Leopard. *Source: https://zapovednik-khakassky.ru/en/news-archive/ohotnik-na-snezhnogo-barsa-popalsya-v-seti-feysbuk-5722.html*

Poaching of Snow Leopard prey and its effects

Declines of prey species are at least as much a threat to Snow Leopards as illegal killings of the big cats themselves (McCarthy et al., 2017). In Central Asia, the most important prey species are mountain ungulates – Asiatic Ibex, Argali and locally Markhor and Urial – as well as marmots. Similarly to the Argali, poaching is an important driver of declines of other mountain ungulate species through direct mortality and reduction of available habitat, as poached ungulates avoid areas with human presence. Drivers of other mountain ungulate poaching are similar to those described for the Argali above (Section 2.3.2).

Asiatic Ibex is legally hunted across its range with the exception of protected areas and in Kyrgyzstan also regions with an active hunting moratorium. In Kyrgyzstan, the acting hunting law allows hunting only in assigned areas and hunters have to obtain permits from the area managers (Almaz Musaev, pers. comm. 2015). Although few systematic studies have been conducted, the populations of Asiatic Ibex outside of a few protected areas with exceptionally good protection and some game management areas appear to be much below the potential of the ecosystems, and poaching is likely the major driver of population decline or lack of recovery (Reading et al., 2020b). In Kazakhstan, the number of Ibex has been more or less stable over the last 10 years with an overall positive trend and, according to data from regional wildlife inspectorates and hunting areas, is estimated at 24,500 animals (2021); about 13,500 of them live in hunting areas and about 11,000 - in state protected areas.

Marmots are legally hunted in Central Asia. Neither legal hunting nor poaching appear to be a relevant reducing factor for population size or range area, however, no scientific studies of this topic are available. Poaching may have been a significant threat to marmots in the past in some regions, particularly after the breakdown of the Soviet Union, and it might become relevant in the future in case of evolving market demand for marmot derivates.

2.3.4 Bukhara Deer

Scale of Poaching

In the 1990ies poaching caused major declines of Bukhara Deer populations (see Section 1.1.4). Currently, no published data on Bukhara Deer poaching is available. However, indirect evidence as described in the following paragraphs suggests that poaching is still having an impact on Bukhara Deer populations.

Effects of poaching for Bukhara Deer

Poaching is likely one of the key factors limiting the growth of some stagnating populations and the dispersal of Bukhara Deer (CMS 2020a) in the absence of a significant impact of natural predators.

Like closely related Red Deer, Bukhara Deer are social animals with a long bond between mothers and offspring and a transfer of experience between generations. Even a low level of poaching or harassment may thus substantially contribute to the limited use of suitable habitat on a wider landscape scale and cause difficulties in recolonizing former range areas. Beyond the barrier effects of unsuitable habitats and human-made barriers, another reason for the very limited

dispersal of Deer might be effects of both past and ongoing poaching. In some cases, dispersing Bukhara Deer are probably poached before they can colonize new sites (CMS, 2020a).

However, in the absence of targeted research, the effect of poaching is hard to distinguish from other factors limiting population growth, such as habitat degradation, fragmentation, inbreeding depression in introduced populations originating from few founders and density-related reduction of reproduction or recruitment.

Reasons for poaching

No published information is available on the reasons for poaching of Bukhara Deer and therefore the following are just considerations by the authors. As deer are common hunting species and venison is valued as meat, it can be assumed that poaching might be motivated by interest in own consumption and potentially commercial sale of the meat. Poaching for trade in antlers for medicinal purposes is another possible reason, but rather unlikely given the overall small numbers of Bukhara Deer and the availability of antlers from other (mostly legal) sources. Hunting for leisure or sports might be a more likely driver.

The ecological plasticity of the animals should allow the species to use landscapes modified by humans, including farmlands and poplar plantations. This happens in some areas and can be the source of conflict with farmers, as in the surroundings of Zarafshon National Nature Park (Marmazinskaya, pers. comm. 2017) and Baday-Tugay (Gritsyna et al., 2019), both in Uzbekistan. These conflicts likely result in illegal killings, but no data on these incidents is currently available to the authors of the study.

3. Community-based wildlife management

3.1 Principles of sustainable community-based wildlife management

Sustainable wildlife management is defined as "the sound management of wildlife species to sustain their populations and habitats over time, taking into account the socioeconomic needs of human populations" (CBD, 2018). One way to ensure sustainability is to involve people who live close to wildlife in its protection and management, while also allowing them to benefit from this involvement. If certain preconditions are met, this approach leads to a win-win situation for conservation of wildlife and for local communities. In the following chapter we describe the theory of CBWM and its basic principles.

Community-based wildlife management (CBWM) – has been defined as "a collective social process by which rights holders agree to hunt or fish in a defined geographic area in ways that maintain animal populations at stable levels over many decades" (FAO et al 2021). A variety of other terms are used throughout the literature – and in practice – to mean broadly the same thing – for example Community-Based Natural Resources Management (CBNRM) or Community-based Conservation (CBC), but there is no single, consistent definition of these terms (Roe et al., 2009). Generally, however, they are used to describe the management of wild living resources – including terrestrial and aquatic wildlife, plants, forests and forest resources – by collective, local institutions for local benefit. CBWM may involve commercial uses of wildlife, such as tourism or hunting, or it may be conducted purely for subsistence or cultural purposes (such as conserving medicinal plants for traditional home use, or conserving forests for spiritual connections). CBWM may involve extractive practices such as hunting and fishing, or it may involve non-extractive practices such as wildlife-watching or protection of particular species with cultural values (for example totemic species).

CBWM is not a novel approach to conservation – Indigenous Peoples and local communities (IPs and LCs) have managed the land on which they live and the natural resources with which they are surrounded for millennia. Since the 1980s, however, there has been a growing awareness of the importance and effectiveness of locally led wildlife management practices and the institutions that support these (Roe et al., 2009). A wide range of policy-makers and practitioners in conservation and development have supported efforts to revive or bolster local natural resource management institutions in response to various economic, social, environmental and political challenges, or to involve local people in new nature-based practices (for example community-based tourism initiatives) as a means to generate incentives for conservation or to diversify local economic development strategies.

The rise of the CBWM narrative began in the late 1980s, during which there was a growing realisation that a) protected areas alone were not meeting conservation objectives and b) people could no longer be excluded either politically or physically from conservation and the management of natural resources (Roe et al., 2009). Prior to this, conservation practice globally was influenced by the North American approach of National Parks that separate humans and wildlife. Southern Africa was the birthplace of this 'new' approach to conservation (new at least to the extent that specific projects and programmes were designed and implemented such as the well-known Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) in Zimbabwe, and the Luangwa Integrated Rural Development Project (LIRDP) in Zambia). These projects provided both inspiration and models for a wide range of CBWM initiatives that subsequently started around the world.

CBWM covers a wide range of resource use practices, given the great diversity of both human communities and resources. It can be formal (i.e. implemented through specific projects or programmes) or informal – reflecting customary and traditional practices. The theory behind the approach is based on the theory of common property resources and resource governance (e.g. Ostrom, 1990; Agrawal, 2001). Common property resource theory highlights how some resources have traditionally been managed collectively rather than individually because they are subject to shared uses, and it would be too costly to individualize the resource. At the same time, if such resources are left entirely ungoverned (or 'open access') then they will be subject to depletion through a 'tragedy of the commons' scenario whereby all users compete to access and utilize the resource.

Resource governance theory highlights how sustainable collective resource governance arrangements are characterized by local groups of resource users ('communities') developing and agreeing to shared rules that limit and regulate resource uses. In this way, local communities can sustain and conserve valuable shared resources through their own self-governance arrangements. A vast body of literature - from the 1990s (e.g. Murphree, 1993) to the present day, based on academic theory such as that described above and supported by decades of practical experience, describes the characteristics of both human communities and resources that tend to lead to sustainable collective resource governance systems- i.e. successful CBWM.

The UNEP "Wild Life, Wild Livelihoods" report (Cooney et al., 2018) synthesizes insights and lessons from decades of experience in community wildlife management (CWM) mostly from the African continent. A key lesson among these is the need for policies that provide an enabling framework for devolved benefits, management and sustainable use of wildlife. However, what has also become clear is that other sectoral policies, often operating in tandem, may incentivize livestock and agriculture over wildlife or, severely constrain wildlife numbers (e.g. veterinary or phytosanitary regulations). These, and poor land use planning, can undermine the sustainability of wildlife management and use.

Importantly, supportive policy frameworks are not the only requirement. Table *4* provides a brief overview of key factors that enable or constrain effective and sustainable CBWM.

Perhaps the most significant overarching principle of CBWM is that local communities should have the authority to manage lands and natural resources in the ways they choose through locally devised rules and procedures, as communal property. Murphree (1993) emphasized this fundamental principle in his analysis of the CAMPFIRE programme noting that "*The evidence is that communities can become effective institutions for sustainable resource management, but only if they are granted genuine proprietorship, that is, the right to use resources, determine the modes of usage, benefit fully from their use, determine the distribution of such benefits and determine rules of access. Any policy which excludes these components will frustrate the goal of making communities effective institutions for resource management.*"

Table 4: Lessons learned from community-based wildlife management on factors that enable and disable community involvement – based on Cooney et al. (2018).

Factors	Enablers of community involvement in sustainable wildlife management	Disablers of community involvement in sustainable wildlife management
Wildlife attributes	High economic and/or social/cultural value – or at least high enough to compete with other land uses. Wildlife needs to be close, accessible, and its use in tune with other livelihood strategies	Sometimes very high economic value restricts government willingness to support IPLC involvement and also makes it harder for communities to secure and enforce common property rights. Similarly, rare and/or localised species may be subject to more regulation Migratory species are more difficult to manage due to operational practicalities and difficulties gaining consensus on ownership and rights
Community attributes	Small homogenous user groups – experience implies these tend to work better together than widely dispersed, socioeconomically or ethnically diverse ones	Lack of understanding of actors and interests and the local institutional arrangements that mediate their relationships with each other
Community management organisations	Institutions and organisations that have the capacity and motivation to manage wildlife. Sometimes this will be a traditional authority, or a new institution Availability of support to build institutional capacity where it is weak Devolution to the lowest level possible with downward accountability Strong and effective leadership	External donors and imposed external organisations along with their rules (including sanctions and bans) and processes (e.g. monitoring protocols and key performance indicators) Powerful vested interests that resist devolution of resource rights or local elites that capture the majority of benefits.
Community resource use rules	Strong, enforceable land and resource rights Locally determined and enforceable resource use rules often based on social norms Enforcement support when needed	Lack of support for, recognition of, and implementation of local rules and regulations and imposition of contradictory, externally developed rules

	A balance between customary and statutory law	
National policy and legislation	Supportive national policy and legislative framework that facilitates all the factors identified above	Competing sectoral policies that undermine devolved management and sustainable use – e.g. "perverse" livestock subsidies; veterinary fencing; lack of coordinated land use planning Bureaucracy associated with complex regulations and guidelines Stricter policy and legislation in third party countries, for example, unilateral trade bans on the use of certain wild species or their products
External support and influence	Technical support provided by governments and NGOs Provision of appropriate and accessible infrastructure Capacity and skills development NGOs working as trusted partners Accessible and flexible financial support Business/enterprise development support and market linkages	Patronage and corruption – often associated with bureaucracy Agenda driven NGOs with no accountability to local people and little understanding of practical realities on the ground

In reality, even the most progressive CBWM initiatives involve some degree of co-management with the State since the enforcement of their rights over resources inherently demands a significant role for the state in underpinning local management systems (Murphree, 2000). Herein lies one of the key challenges for CBWM: in many cases, State actors – whether individuals or agencies – possess strong *disincentives* to provide this enabling framework because it may clash with other interests, patronages or political powers (Nelson and Agrawal, 2008). In particular, devolving or decentralizing rights over valuable natural resources may conflict directly with such interests, causing many CBWM initiatives to fail. This is particularly concerning in light of the global assessment of the state of the world's ecosystems published in 2019 by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). The authors' assessment found that, while biodiversity is declining across the globe, it is declining less rapidly on lands that are owned or managed by IPs and LCs. These lands are, however, under increasing external pressure – with severe implications for both biodiversity and IPs' and LCs' livelihoods. State recognition and strengthening of IP's and LC's rights is fundamental to reversing this situation.

Getting the conditions right for CBWM is critical for not just enabling communities to sustainably manage and benefit from wildlife (e.g., through involvement in tourism, or hunting, or collection and sale of forest products), but also to incentivize them to protect wildlife from poachers. There is a fine line between communities acting as protectors or poachers of wildlife, and it rests on the balance of costs and benefits between the two. As highlighted by Cooney et al. (2016) "It is a reasonable assumption that for wildlife conservation to prevail, a necessary but not sufficient condition is that the expected net benefits (benefits minus costs) of wildlife conservation to community members with the means and opportunity of engaging in IWT must be greater than the net costs." Figure 18 illustrates this simple principle.

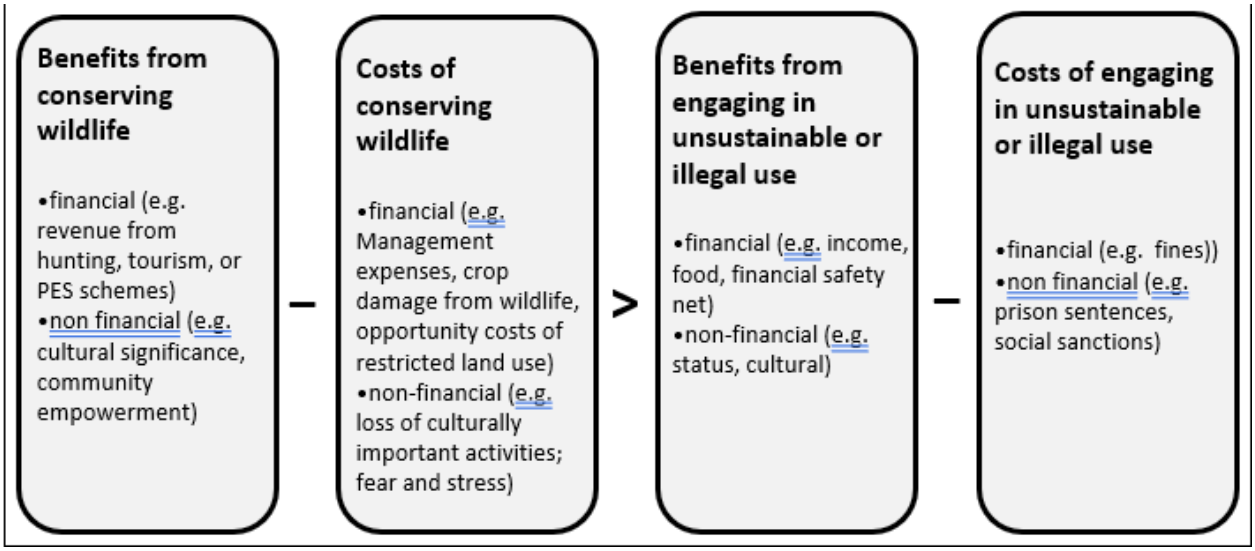

Figure 19: Net benefits must exceed net costs if CBWM is to be effective against poaching (Figure from Cooney et al., 2016).

A review of lessons learned on the effectiveness of community-based approaches to tackle illegal wildlife trade (Roe and Booker, 2019) found strong resonance with the principles highlighted in Table 4 drawn from decades of experience on CBWM. Key among these lessons is the failure to move from policy commitments on community-based conservation to real implementation on the ground. A community statement presented to the London Conference on Illegal Wildlife Trade in 2018 noted "We are the people who are the most affected by the illegal wildlife trade and can be the most powerful force to address this problem. But this will only happen if communities are empowered and can benefit from wildlife." (IIED et al., 2018).

Most recently a review of lessons from case studies in a global database of initiatives to engage communities in tackling illegal wildlife trade (People not Poaching, 2022) found that key principles for success were:

1. Recognise community rights to make decisions about, and benefit from, wildlife;
2. Increase benefits and reduce costs from living with wildlife;
3. Listen to community needs and priorities and base approaches on the local context;
4. Respect and incorporate existing community structures and norms and build on them wherever possible;
5. Develop long-term relationships to build trust;
6. Establish multi-level partnerships that are driven by communities;
7. Pay attention to challenges related to political instability, corruption or militarised conservation.

The importance of locally led approaches is becoming increasingly clear in the climate change sector. For example, an ever-growing number of international organisations, governments and donor agencies have endorsed a set of eight principles for Locally Led Adaptation (LLA) (Soanes et al., 2021):

1. Devolving decision making to the lowest appropriate level

Giving local institutions and communities more direct access to finance and decision-making power over how adaptation actions are defined, prioritised, designed and implemented; how progress is monitored; and how success is evaluated.

2. Addressing structural inequalities faced by women, youth, children, disabled and displaced people, Indigenous Peoples and marginalized ethnic groups

Integrating gender-based, economic and political inequalities that are root causes of vulnerability into the core of adaptation action and encouraging vulnerable and marginalised individuals to meaningfully participate in and lead adaptation decisions.

3. Providing patient and predictable funding that can be accessed more easily

Supporting long-term development of local governance processes, capacity, and institutions through simpler access modalities and longer term and more predictable funding horizons, to ensure that communities can effectively implement adaptation actions.

4. Investing in local capabilities to leave an institutional legacy

Improving the capabilities of local institutions to ensure they can understand climate risks and uncertainties, generate solutions and facilitate and manage adaptation initiatives over the long term without being dependent on project-based donor funding.

5. Building a robust understanding of climate risk and uncertainty

Informing adaptation decisions through a combination of local, Indigenous and scientific knowledge that can enable resilience under a range of future climate scenarios.

6. Flexible programming and learning

Enabling adaptive management to address the inherent uncertainty in adaptation, especially through robust monitoring and learning systems, flexible finance and flexible programming.

7. Ensuring transparency and accountability

Making processes of financing, designing and delivering programmes more transparent and accountable downward to local stakeholders.

8. Collaborative action and investment

Collaboration across sectors, initiatives and levels to ensure that different initiatives and different sources of funding (humanitarian assistance, development, disaster risk reduction, green recovery funds and so on) support one another, and their activities avoid duplication, to enhance efficiencies and good practice.

With the exception of Principle 5, which is specifically about climate risk, all of these principles could equally be applied to locally led conservation – or CBWM.

3.2 Community-based wildlife management approaches in international policy

Having provided the theory of CBWM in 3.1, we now explain how the recognition of this approach evolved in international policy from the perspective of wildlife conservation and the human rights of people living close to wildlife.

The importance of supporting CBWM was first (indirectly) articulated in international conservation policy in the World Conservation Strategy (IUCN, UNEP and WWF, 1980) which stressed the importance of linking protected area management with the economic activities of local communities. This approach was further emphasized at the 1982 IUCN World Congress on National Parks in Bali, which called for increased support for communities through education programmes, revenue-sharing schemes, participation in the management of reserves, and the creation of appropriate development schemes near protected areas (McNeely and Miller, 1984).

At the 5th World Parks Congress in 2003 – and thanks to years of thought leadership and advocacy by a small group of members of IUCN Commissions on Protected Areas and on Economic, Environmental and Social Policy – the concept of "Indigenous and Community Conserved Areas (ICCAs)" was recognized as a more diversified and equitable form of conservation area governance and management compared to State-led protected areas. ICCAs are defined by three characteristics, reflecting Ostrom's common property resource governance principles discussed above in Section 3.1 (Sajeva et al., 2019):

1. An Indigenous people or local community possesses a close and profound relationship with a site (territory, area or habitat);
2. The people or community is the major player in decision-making related to the site and has de facto and/or de jure capacity to develop and enforce regulations; and
3. The people's or community's decisions and efforts lead to the conservation of biodiversity, ecological functions and associated cultural and spiritual values, regardless of original or primary motivations.

ICCAs (and inherently, CBWM) have since been recognized at subsequent World Parks Congresses and World Conservation Congresses of the IUCN through a variety of decisions and resolutions.

Perhaps, the strongest support for CBWM comes from international human rights policy more so – or at least as much as – conservation policy. The UN Declaration on the Rights of Indigenous Peoples, adopted by the General Assembly on 13 September 2007, for example, calls on states to obtain free, prior and informed consent (FPIC) of indigenous people before adopting legislative or administrative measures that would affect them. Similarly, the UN Declaration on the Rights of Peasants and Other People Working in Rural Areas adopted in 2018 calls on states to "consult and cooperate in good faith" with peasants and other people working in rural areas who could be affected by decisions before those decisions are made. Wildlife conservation and management policies are amongst the types of measures or decisions that can deeply affect IPs and LCs in rural areas given their close ties to landscapes and seascapes and the natural resources therein and their role in effectively managing them. Overlooking IPLC rights is a breach of human rights law and has direct or potential impacts on IPLCs' ability to meet their daily health, food security and other essential needs.

In terms of multilateral environmental agreements, the CBD provides the overarching policy framework for global conservation policy and includes recognition of the rights, practices and knowledge of IPLCs in its foundational text – including specifically in Articles 8(j) on traditional knowledge, innovations and practices, and 10(c) on customary sustainable use. Since 2004 it also

has specifically recognized the existence and relevance of ICCAs including through its Programme of Work on Protected Areas. It has also produced various guidance documents that support CBWM including the 2004 Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity. Within this guidance, Practical principle 12 states: "The needs of indigenous and local communities who live with and are affected by the use and conservation of biological diversity, along with their contributions to its conservation and sustainable use, should be reflected in the equitable distribution of the benefits from the use of those resources".

In December 2022, Parties to the CBD agreed a new Global Biodiversity Framework to guide global conservation policy to 2050. In the three years of negotiations leading up to the adoption of the Kunming-Montreal Framework (KMF), there was a steadily increasing emphasis on the rights of IPs and LCs to actively participate in decision-making, to be at the forefront of conservation action and to have their rights to use, access and benefit from biological resources recognized and protected. These rights are now front and centre of the KMGBF. One target which caused significant controversy in the negotiations was the so-called "30x30" target which aims for at least 30% of global land and sea area to be protected by 2030. Concerns were raised about this target in terms of the implications for IPLC if it were to be implemented in the form of exclusionary protected areas. The target includes, alongside protected areas, the concept of "Other Effective Conservation Measures" (OECMs) defined in 2018 as *"A geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in-situ conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values."* This potentially includes many areas where CBWM is practiced including indigenous territories, conservancies and other forms of ICCAs where CBWM is practiced. Notably, the final wording of the target specifically recognizes Indigenous territories, and it emphasizes that any sustainable use should "be consistent with conservation outcomes, recognizing and respecting the rights of indigenous peoples and local communities." Other key targets in the Kunming-Montreal Framework that are of direct relevance to CBWM include:

- Target 5 which aims to ensure that all use of wild species is sustainable, legal and safe;
- Target 9 which again emphasizes that all use must be sustainable, legal and safe, but in this case, the rationale is so that use of biodiversity can continue to provide benefits to people – particularly those most dependent on biodiversity and including through "biodiversity-based activities"; and
- Target 22 which aims at ensuring the full, equitable, and inclusive representation and participation of indigenous peoples and local communities in decision-making.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) has the purpose to regulate the international trade in the species listed under CITES so that it does not cause or contribute to their extinction risk and to ensure that trade is sustainable. The listing of species in the CITES Appendices aims at regulating international trade in the listed species and to requirements for import and export permits issued by CITES management authorities of importing and exporting countries, depending on the provisions in place for the respective Appendix. The inclusion of species in Appendices to CITES is based on assessment criteria for the general level of extinction risk and the specific threats associated with international trade. Aspects of livelihoods and impacts of listing for local communities have been proposed by some CITES parties to be considered in the listing process, but this has not been accepted by the CoP. The issuance of import and export permits is based on Non-detriment findings (NDF) by the respective CITES scientific authorities. Incentives for the conservation of the respective species generated through sustainable use and community-based management

can be considered in the NDF, but are not mandatorily assessed, as such aspects are not an integral part of the actual provisions of the Convention.

CITES Parties recognize that benefits derived from wildlife use can act as an incentive for conservation. Resolution Conf. 16.6 (Rev CoP18) adopted by CITES COP16 on CITES and livelihoods states that that the implementation of CITES is better achieved with the engagement of rural communities, especially those that are dependent on CITES-listed species for their livelihoods. The Working Group on CITES and Livelihoods was established in 2008 by the CITES Standing Committee. Its terms of reference, *inter alia*, include documenting examples of how trade in CITES-listed species can support both conservation and livelihoods – often through CBWM approaches. These examples are made available on the CITES Website as a set of case studies from around the world including one of Markhor management from Tajikistan.

At COP16 in 2013, the Working Group presented a toolkit for assessing the positive and negative impacts of implementing CITES listing decisions on the livelihoods of the poor, as well as voluntary guidelines for Parties to address the negative impacts (Information document CoP16 Inf. 21).

CITES is also considering governance reforms related to CBWM. Arguments have been made for including a Rural Communities Committee as an additional decision-making body in CITES. While this is not politically feasible in an intergovernmental treaty – where by definition the decision-makers are the governments that are the Parties to the treaty – at COP17 in 2016, Decision 17.28 directed the CITES Standing Committee to form a working group "to consider how to effectively engage rural communities in the CITES processes" and at CoP18 in 2019, Parties amended Resolution Conf. 16.6 (Rev. CoP18) on CITES and Livelihoods to, *inter alia* note that "empowerment of rural communities should be encouraged" and highlighted a range of measures including:

> i) engaging rural communities in national processes when preparing proposals and other documents for CoP;
>
> ii) including representatives of rural communities in official national delegations;
>
> iii) promoting transparency and participation of rural communities in the development and implementation of national CITES-related policies;
>
> iv) maximizing the benefits for rural communities of CITES implementation and trade concerned, in particular to support poverty eradication.

Also, at CoP18, Decision 18.31 called on the Standing Committee to re-establish the intersessional Rural Communities Working Group and for it to consider how to effectively engage rural communities in CITES processes and to develop guidance on how best to consult with rural communities on proposals to amend the Appendices.

Decision 18.31 was reaffirmed at COP 19 and an intersessional working group re-established to continue working on these issues while Decision 19.54 invited Parties to engage IPLCs in decision-making and implementation processes at the national level and to share their experiences in doing so.

CITES seeks to regulate legal wildlife trade to remain within sustainable limits but over the last decade a key policy priority from both conservation and development perspectives has been tackling escalating and highly organized *illegal* wildlife trade. Since 2014, concerns over the rising threat of poaching to high-value species, such as pangolins, elephants and timber, have led to several international policy forums with four overarching priorities:

1. Eradicating the market for illegal wildlife products

2. Building effective legal frameworks

3. Strengthening law enforcement

4. Supporting sustainable livelihoods and economic development

These policy forums – held in London in 2014, Kasane in 2015, Hanoi in 2016 and again in London in 2018 – along with others, recognized the importance of community engagement in efforts to tackle IWT. The resulting statement or declaration from each of these events made several commitments in this regard, which can be grouped into seven broad themes (WWF and IIED, 2019):

- Tackling negative impacts of IWT
- Supporting sustainable livelihood opportunities
- Supporting community-led conservation
- Supporting wildlife-based livelihoods/benefits
- Involving local people as law enforcement partners
- Reducing the costs of living with wildlife
- Supporting information sharing about community-based approaches

Despite these political commitments, formalized in the outcome statements or declarations of each conference (UK Govt 2014; 2015; 2018; Vietnam Govt 2016) there remains a continued emphasis on law enforcement over community-based approaches to reduce IWT worldwide. For example, analysis of the international policy commitments in the frame of MEAs prior to the 2018 London Conference showed that least progress had been made against those in the *supporting sustainable livelihoods and economic development category* (WWF and IIED, 2019).

Similarly, a World Bank report released in 2016 showed that just 15% of the US$1.3 billion invested between 2010 and 2016 in efforts to reduce IWT was allocated to community-focused projects (Wright et al., 2016). This was in comparison to 65% allocated to protected area management and law enforcement during the same period and the remaining 20% for education, outreach and other measures. Although these analyses are not the newest, this pattern seems unlikely to have significantly shifted.

In conclusion, CBWM approaches are anchored both in international human rights policy and in biodiversity conservation policy. The UN General Assembly Declarations on the Rights of Indigenous Peoples and on the Rights of Peasants and Other People Working in Rural Areas are clear that upholding community rights must be supported to uphold human rights. In terms of conservation, CBWM was shown to be an effective approach to combat illegal wildlife trade and to ensure sustainability of natural resource use. This is reflected in the KMGBF and CITES Decisions, which support CBWM. The success of such approaches depends on a number of factors, including the existence of an enabling policy framework to empower local people. The renewed emphasis on IPLC rights – particularly in the KMGBF – provides hope that CBWM will be increasingly implemented by policy-makers and practitioners worldwide.

3.3 Examples of successful community-based wildlife management worldwide

3.3.1 Conserving the American crocodile in Colombia

Heavy trade in skins in the early 1900s led to major declines in the American Crocodile *Crocodylus acutus*, which was almost eliminated from its natural habitat in most parts of Colombia. Populations became restricted to small, isolated pockets, such as within the mangroves of the Bay of Cispatá. To protect the species, the American crocodile was included in Appendix I of CITES in 1975 with the exceptions of some populations listed on Appendix II, thus preventing commercial trade, and at the same time the government of Colombia also banned hunting of the species. Colombian NGO ASOCAIMAN notes that whilst these measures were intended to help conserve the American crocodile, they were counterproductive because local people lost a key incentive to protect the crocodile's mangrove habitat from ongoing (and continuing) coastal development (People not Poaching, 2022).

In 2003, as part of a wider management plan for the area's mangroves, a group of 18 ex-hunters became active participants in a programme to manage the American crocodile, involving research, monitoring and environmental education activities directed towards the recovery and conservation of the species. Their reported motivation for this engagement was the anticipation of future trade opportunities if the crocodile populations could be recovered and the CITES listing down-graded (People not Poaching, 2022).

In 2006, this group of ex-hunters formed the Association for the Conservation of the American Crocodile in Cispatá Bay (ASOCAIMAN), a legal association to consolidate, build and sustain the crocodile management programme. The aim of ASOCAIMAN is to meet the development needs of the local people by building their capacity to manage and benefit from wildlife – in the form of tourism opportunities and potentially future trade opportunities. Former crocodile hunters were trained to become skilled managers of the species, and this soon expanded to include ecotourism training. The conservation strategy of the species is based on scientific research, education and traditional knowledge and includes monitoring of wildlife populations, habitat management, and egg harvesting to raise hatchlings, improving the survival rate of wild-born hatchlings.

The conservation and monitoring actions implemented by ASOCAIMAN members have led to the recovery of the Bay's population of the crocodile in their natural environment, with an almost 200% increase over a 10-year period. Former crocodile hunters are now strong advocates for the conservation and sustainable use of the species and no longer engage in poaching. The initiative is owned by local people and has improved their livelihoods through income from tourism activities, which are centred on the ex-hunters and the success they have achieved.

In recognition of improvements to the conservation status of the species, in 2016 at the 17th CITES COP, the American crocodile population of the Bay of Cispatá was moved to CITES Appendix II and in December 2018, the Environmental Ministry of Colombia lifted the ban on trade of the species at Cispatá Bay. While animals caught in the wild still cannot be traded, limited trade permits for crocodiles hatched from harvested and incubated eggs are available, allowing communities to sell skins once the crocodiles have been raised to a certain size. This creates an incentive for habitat conservation, as a continuous supply of eggs for collection from the wild and following incubation is needed, requiring the crocodile habitat to be in good condition to support a large and healthy population.

The promise of a sustainable crocodile skin industry has been key to maintaining the enthusiasm and engagement of local people in the initiative, who understand that they will benefit once the

crocodiles have reached a size where their skins can be sold to commercial buyers. With support from the Ministry of Science, Technology and Innovation, ASOCAIMAN has been establishing the legal framework for the sustainable use industry as well as equipping local people with the skills they will need to effectively participate.

3.3.2 Communal conservancies in Namibia

During the 1990s, following its independence from South Africa in 1990, the government of Namibia made a series of policy and legislative changes that gave local people living on communal land the rights to manage and benefit from the wildlife on their land. In order to gain such rights, communal area residents had to form a community institution called a conservancy with a legal constitution, a representative management committee, a defined land area with clear boundaries and registered members (thus conforming to many of the Ostrom principles of common property resource governance highlighted above in 3.1). The first communal conservancies were registered in 1998 and there are now 86 covering 166,045 km² (over 20% of the country) and involving over 238,701 people (MEFT/NACSO, 2023).

Conservancies earn income through leasing concessions for trophy hunting and tourism as well as running their own tourism initiatives and meat hunting initiatives. Hunting on conservancy land is governed by quotas set by the government. There are currently 42 joint venture lodges in Namibian conservancies, and in some of those conservancies, tourism is becoming the key source of income, replacing trophy hunting. The two activities are strictly separated by zoning conservancies into different land use areas, including agriculture. Although tourism and hunting provide important income diversification, farming is still the main source of livelihood for most conservancy members. However, with the growing effects of climate change, access to alternative income streams will become increasingly important. Since 1990, the programme has had an economic internal rate of return of 18% and has earned an economic net present value of just over N$ 2.027 billion. This is an exceptional economic return for a programme investment (MEFT/NACSO, 2023).

Conservancy management has facilitated large-scale wildlife recoveries and enabled the protection of valuable species and intact wildlife habitat. One example is the Black Rhino *Diceros bicornis* between 1960-1995, large-scale poaching caused a 98% drop in the numbers of Black Rhino, leaving just 2,400 individuals left in the wild. Thanks to conservation efforts, the population has doubled since the 1990s, and Namibia now has the largest concentration of free-roaming black rhino in Africa. However, the species continues to be threatened by IWT. A Conservancy Rhino Ranger Incentive Programme provides conservancy game guards with training, uniforms and equipment and supports them to develop rhino-based tourism. The number of confirmed poaching incidents decreased by 90% between 2018-2022, compared with the previous five-year period, with only 4 rhinos lost in the past 4.5 years. New sources of local income (from rhino tourism) have been successfully generated amounting to over US$1 million since the programme began in 2012. Both financial and non-financial benefits (training, uniforms, equipment, status) that come with being a rhino ranger have fostered enthusiasm and pride, as well as reinforcing a sense of ownership in the wider community (Muntifering, 2018).

3.3.3 Community based management of vicuña in Peru

Vicuña are small camelids that inhabit the Andean mountains of Argentina, Bolivia, Chile, Ecuador and Peru. Since the Spanish Conquest, but particularly in the last century, they have been subject

to unsustainable hunting with the species nearing extinction in the 1960s. In 1969, Peru and Bolivia, under the newly established Convention for Vicuña Conservation, agreed to ban all hunting and sale of vicuña for a period of ten years. The species was listed on CITES Appendix I in 1975 and all international trade was banned.

While these interventions helped to reduce pressure from illegal hunting on vicuña, competition for grazing with local farmers' alpaca and llama herds meant that there was little local incentive for them to conserve the species. In 1979, the ban on commercial trade in vicuña fiber was lifted under the Vicuña Convention and was replaced by strictly regulated management and in 1980, following strong political pressure from local communities for access to a potentially valuable resource, the Peruvian government granted local communities the rights to capture and shear vicuña in order to benefit from the trade in fiber.

Fiber production from wild vicuña involves a community based *chaccu* – where the Vicuña are herded into a confined area which is funnel-shaped resulting in one at a time being presented for shearing. Shearing may be done manually or using a machine and the animals are then released. The fiber is then cleaned and sorted according to quality before being shipped.

The revenue generated by the sale of Vicuña fiber can be substantial when large volumes of fiber are sold (although this is not the case for all communities). The community of Lucanas in Peru produces 1,200 kg of vicuña fiber per year from its own animals, and 300 kg from a programme designed to increase Vicuña numbers. According to Lucanas's leaders, the sale of fiber contributes to the community's social development, providing food supplements for the elderly, payments to the church, funding for education, and purchases of machinery such as tractors. Revenues are also generated from the sale of vicuñas to other communities for repopulation programmes and for tourist chaccus (CITES, 2022).

Granting communities the right to capture, shear and sell the fiber from wild vicuñas generates five times the value of hunting and killing the animals and provides a strong incentive for conservation. The recovery of the vicuña from near extinction in the 1970s to the thriving levels of the population today is a well-known conservation success story. In Peru, for example, vicuña numbers increased from a low of 10,000 in 1969 to over 200,000 in 2012. In 2008, IUCN reclassified the animal from "Endangered" to "Least Concern" on its Red List (CITES ,2022).

Nevertheless, to maintain the incentive to conserve vicuñas it will be critical to further enhance community benefits as there is a continuous threat of poaching. The community has limited power to dictate the price of vicuna fiber since sales are organized through the government to a limited number of buyers. Returns to the community are currently quite low but additional opportunities could be explored including local-level value addition rather than export of raw fibers. Simplified regulations for exporting vicuña fiber would also enhance market access for communities (CITES, 2022).

3.3.4 Conservation Cooperatives in Indonesia

In West Kalimantan, the NGO Yayasan Planet Indonesia has introduced a Conservation Cooperative approach to revitalize traditional management practices and incentivize sustainable wildlife management. Similar in some ways to a conservancy, the Conservation Cooperative provides the governance structure to serve as a community-led management authority capable of engaging all community members in the management of surrounding natural resources. It also facilitates access to much needed non-financial and financial services for vulnerable rural communities living across West Kalimantan's protected areas including a savings and loans scheme and a community-based healthcare programme.

In return for access to services, communities are involved in monitoring and enforcing both national and customary rules related to the management of forests and wildlife. Community-led patrols consist of one government park ranger, three or four villagers who are part of the cooperative, and one NGO staff member. Community members are paid for their time and provided with uniforms and equipment as well as having access to the other benefits that being in the cooperative entails, as described above. In two sites in West Kalimantan - Gunung Nyuit and Gunung Naning - these patrols have removed over 3,400 snares and analysis of patrol data between 2018-2022 has shown a steep decline of 87% in illegal hunting, encroachment and logging within the areas patrolled. Patrol data, alongside social surveys of local exports, shows that wildlife encounter rates have also increased. Deforestation rates have also dropped by 56% (Planet Indonesia, 2021).

Since 2019, three of the villages have used the Conservation Cooperative model to revitalize the traditional Dayak customary law (*hukum adat*) to prohibit excessive logging in priority zones, as well as the hunting of certain species near the reserve, including the critically endangered Helmeted Hornbill. Conservation Cooperatives community members can exchange rifles to receive cash and non-cash incentives. This exchange programme is supported by the local police and government management authority. Individuals are also required to sign a commitment to non-poaching upon surrendering their rifle (Planet Indonesia, 2021).

The foundation of this successful community-led conservation model is trust underpinned by positive relationships. At Yayasan Planet Indonesia, field staff are often from the communities they work with and develop strong relationships in the villages they partner with. All too often, local communities are promised all sorts of benefits from conservation interventions, but these benefits never materialize. This can result in distrust and resentment as a result of false promises and dismissal of local needs and aspirations. Overcoming this is critical to the success of this initiative. In this case tangible benefits in the form of access to credit and access to healthcare are provided in return for pro-conservation behaviour within the overall context of a community-based governance institution – the cooperative – and long-term engagement by a support NGO (Planet Indonesia, 2021).

3.4 Current community-based wildlife management projects and practices in Central Asia

3.4.1 Evolution of community-based wildlife management in Central Asia

In this section we take a closer look at the way community-based approaches became integrated in wildlife management in Central Asia during recent years. We explore why the approach was not implemented earlier and characterize the first initiatives for its application.

During the Soviet period and after independence of the Central Asian countries, community-based approaches for wildlife management have not been considered as potential ways to improve the status of wild animals and for achieving local support for conservation and direct benefits for local people. The reasons for this neglect are manifold, difficult to assess, and can only be guessed based on statements of different actors – international, national and local.

Decades of centralized management of all types of natural resources like pastures, forests and huntable and protected wildlife resulted in at least a partial loss of traditional practices and knowledge of native peoples with respect to natural resource management. In addition, the interest in alternative approaches as well as capacities to explore them were limited. After the collapse of the Soviet Union, resulting in the loss of the centralized management system and an enforcement vacuum, many stakeholders regarded the reinstallation of a similar top-down management and conservation of wildlife with some modern modification as the only solution. The drawbacks of the Soviet wildlife management system (see section 1.1.4) were insufficiently addressed by newly established, but still centralized systems, which relied primarily on enforcement of wildlife protection. Additionally, the capacities and resources for conducting research to understand drivers of poaching and to develop novel approaches were lacking.

In general, poverty coupled with few economic alternatives for those engaged in poaching as well as insufficient law enforcement were regarded as the major drivers of poaching. Consequently, the first wildlife conservation actions in independent Central Asian states, particularly supported by international organizations, focussed on the improvement of law enforcement and income generation for local people through alternative livelihood options. These efforts had positive, but limited effects. For example, such projects resulted in the development of effectively functioning protected areas or well-organized anti-poaching units, such as NABU's "Grupa Bars" and ILBIRS Foundation's anti-poaching group in Kyrgyzstan and generated support for the teams of the state-owned wildlife protection and hunting enterprise Okhotzooprom in the Saiga Range in Kazakhstan.

However, there were also shortcomings to these approaches as law enforcement always has its limitations and several examples show that weakening law enforcement due to changed government priorities or ceased funding quickly leads to increased poaching. Prominent examples of this are the extermination of the Asiatic Wild Ass in Badkhyz Strict Nature Reserve in Turkmenistan around 2014 (Kaczensky & Linnell, 2015) and the rapid decline of Mongolian Saiga after the end of funding of a special anti-poaching unit in 2014 (Buuveibaatar, pers. comm. 2015; CMS, 2015; Chimeddorj & Buuveibaatar, 2017).

Similarly, the effectiveness of alternative livelihoods and income generation in reducing poaching by local people is limited. As described above (see section 2.3), depending on the species and landscape, most poaching can be done by a few very specialized people and their motivation is not necessarily that of consumption for subsistence or economic gain. Therefore, alternatives do not always reach those individuals involved in poaching. For instance, this was evident in Tajikistan, where alternative livelihoods in form of labour migration and remittances from these

migrants provided a major alternative income, but still in most areas either enough poachers remained or people during a vacation in their home regions poached, thus driving declines of wild ungulates. To what extent alternative options can address commercial poachers depends on the suitability and attractiveness of these alternatives. In case a commercially attractive illegal market for some species of wildlife exists, ex-poachers are quickly replaced by new people (Michel, findings from interviews with local people, 2007 – 2021).

Among the reasons for the hesitation to consider the application of community-based wildlife management as a wildlife conservation approach were perceptions that local community members were not willing or not able to implement such approaches successfully. Experts from governments and NGOs thought that due to the Soviet legacy or local cultural habits no communities with sufficient social cohesion and peer-pressure exist that are able to prevent poaching by residents and outsiders. Furthermore, typically urban representatives of hunters' associations widely doubted that local – both, formal and informal – hunters would be willing to refrain from poaching or to even support the prevention of poaching by others. (Michel, findings from interviews with hunters' association representatives, 2007 – 2014). Community members across Central Asia only in exceptional cases have considered taking over responsibility and gaining authority over the use of wildlife in their area. Due to the long period of full government responsibility most people still feel that government agencies are exclusively in charge of wildlife conservation and management including the regulation of hunting. Additionally, the memory of high crime levels of the post-soviet period, especially when economic competition often resulted in violence, was another deterring factor for assuming responsibility and opening an own business.

As with other public resources, there is often an attitude of indifference, also towards illegal offtake. Associations of hunters have existed across Central Asia and people with a hunting license became its members, however these associations were centrally managed and provided little authority and autonomy to local individual hunters. Informal local hunters may have some interest in sustainability, but this is not always translated in sustainable behaviour, because they neither see a chance of becoming legitimate users of wildlife nor of getting the authority to prevent other local residents or external people from illegal and unsustainable hunting.

In exceptional cases, considerations of applying community-based wildlife management approaches were triggered by various, sometimes informal information on such mechanisms reaching local communities. For instance, in the Pamirs of Tajikistan, the German development organization GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) facilitated the introduction of joint forest management by assigning local people user rights and responsibilities for forest resources on defined plots of the state forest enterprise.

In another area of Tajikistan, a local informal hunter realized that Markhor was on the verge of extinction due to indiscriminate poaching. The small amounts paid by hunting outfitters from outside to local guides for supporting illegal trophy hunts did not provide sufficient incentives to conserve the Markhor, and the lack of area-based rights and responsibilities prevented effective exclusion of other poachers. After having learnt from hunting tourists about the community-based trophy hunting programmes in Pakistan, particularly the prices of legal hunts and resulting benefits for local communities, this traditional hunter established his own small family-based enterprise dedicated to the conservation and future sustainable use of Markhor.

In 2007, the development of a small project on piloting community-based wildlife management in Tajikistan – the Tajikistan Mountain Ungulates Project – started with financial support from the GIZ and from the Germany-based Zoological Society for the Conservation of Species and Populations (ZGAP), NABU and other NGOs. In close cooperation with various national partners

the project helped to initiate the creation of the first community-based groups, which soon got wildlife management areas assigned.

Additionally, the project team recognized that the above-mentioned family-based enterprise for Markhor conservation and sustainable use is also a form of community-based initiative and involved it in the project. Soon more local initiatives followed, organized either as NGOs or as small family businesses. From 2010 onwards, the approach expanded into neighbouring Kyrgyzstan, and since 2015 its application has also started in Kazakhstan. Despite the interest from stakeholders in Uzbekistan, such approaches have not yet been trialed inside the country.

Concluding, the approach of community-based wildlife management or community-based conservation did not receive much consideration in Central Asian states. First trials of the approach were mainly introduced by foreign organizations and yielded some success where local people were interested and successfully empowered by the national/municipal government.

3.4.2 Legal frameworks for wildlife use, protection and preconditions for CBWM – commonalities across Central Asia

Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan share a common history of having been part of the Soviet Union, which is still reflected in their political and legal systems to different extents. This section sheds light on the current legislation of the focal countries concerning wildlife management and protection. Preconditions for CBWM are discussed, opportunities and challenges for the involvement of local communities are explained.

Many commonalities exist in the legislation of the post-Soviet Central Asian countries. Table 5 provides a brief overview of the legislation relevant for this study. The laws typically provide only very broad frameworks while the details of implementation are regulated in multiple bylaws of various levels. The conservation of threatened wildlife is achieved mainly by designating protected areas and listing endangered or rare species in Red Books. These mechanisms also restrict wildlife observation tourism, which is otherwise largely unregulated. The prevailing approach for the management of wildlife for extractive use is the assignment of wildlife management areas to entities which take responsibility for wildlife protection and get the right to hunt/manage hunting in this area. In the following paragraphs relevant legislation for these different aspects of wildlife conservation and management are explained.

Wildlife conservation mechanisms and CBWM

The main area-based mechanism for the conservation of wildlife and its habitat common to all target countries is through protected areas. The core regulations on protected areas originate from Soviet time and have since been developed further with some differences between the countries. Depending on the protected area category, land use and hunting can be prohibited completely or regulated. For instance, in strictly protected areas or zapovedniks, common to all Central Asian States, no anthropogenic activities are allowed. Where this is adequately enforced, wildlife populations and their habitats are well preserved. Other protected area categories allow some traditional land use in certain zones. The protected area category zakaznik (nature sanctuary) is also common to all target countries and particularly relevant for this study. In its current form it can be problematic for wildlife conservation and for the application of CBWM.

Table 5: Laws with major relevance for wildlife management.

Field of regulation	Kazakhstan	Kyrgyzstan	Tajikistan	Uzbekistan
Wildlife management and hunting	Law "On the protection, reproduction and use of wildlife" (*Об охране, воспроизводстве и использовании животного мира*), 2004	Law "On hunting and game management" (*Об охоте и охотничьем хозяйстве*), 2014	Law "On hunting and game management" (*Об охоте и охотничьем хозяйстве*), 2014	Law "On hunting and game management" (*Об охоте и охотничьем хозяйстве*), 2020
Protected areas	Law On specially protected natural territories (*Об особо охраняемых природных территориях*), 2006	Law On specially protected natural territories (*Об особо охраняемых природных территориях*), 2011	Law On specially protected natural territories (*Об особо охраняемых природных территориях*), 2011	Law On protected natural territories (*Об охраняемых природных территориях*), 2004
NGOs	Law "On non-commercial organizations" (*О некоммерческих организациях*), 2001	Law "On non-commercial organizations" (*О некоммерческих организациях*), 1999	Law "On non-governmental organizations" (*Об общественных объединениях*), 2007	Law "On non-governmental non-commercial organizations" (*О негосударственных некоммерческих организациях*), 1999
Land use	Land Code of the Republic of Kazakhstan (*Земельный кодекс Республики Казахстан*), 1999 Law "On pastures" (*О пастбищах*), 2017	Land Code of the Kyrgyz Republic (*Земельный кодекс Кыргызской Республики*), 2003 Law "On pastures" (*О пастбищах*), 2009	Land Code of the Republic of Tajikistan (*Земельный кодекс Республики Таджикистан*), 1996 Law "On pastures" (*О пастбищах*), 2019	Land Code of the Republic of Uzbekistan (*Земельный кодекс Республики Узбекистан*), 1998 Law "On pastures" (*О пастбищах*), 2019

Zakazniks were originally – and in some cases still are – temporary protected areas set up for a defined period, typically ten years to allow for recovery of plant or animal species (see section 1.1.3). Nowadays almost all zakazniks in Central Asia are permanently established protected areas which allow regulated land use. With few exceptions, zakazniks have no own administrations and staff, but are managed by administrations of other protected areas, other nature protection bodies or by the respective land user (often state-owned forestry enterprises). Their conservation effectiveness varies, but many areas are de facto used, in particular for livestock grazing, without enforcement of restrictions.

Depending on the national legislation, either in all forms of zakazniks or in some, e.g., "zoological zakazniks", hunting is prohibited. A similar situation exists in some newer categories of protected areas, e.g. natural parks which ban hunting, but allow other forms of regulated use. For these reasons CBWM with extractive use is currently not feasible in these protected areas. Without a legal hunting option – and no other opportunities for wildlife-based income generation – there are no incentives for local communities to refrain from poaching, protect wildlife or to maintain the habitat of these species. Furthermore, local people have no authority to protect wildlife out of other motivations, such as recognition of its intrinsic value. Habitat degradation and grazing competition with livestock, therefore, continue unabatedly, since livestock keeping remains the economically most viable land use alternative. To reverse this situation, application of CBWM could be very helpful to empower local communities to manage or co-manage wildlife and their habitats in these areas with state agencies.

A species-focused legal protection measure originating in the Soviet Union and common to all Central Asian states is the listing of rare and/or endangered species of plants and animals in Red Books. Such listing generally prohibits the extractive use of the species (see Section 1.1.3). This automatic link of the extinction risk assessment with legal protection from take differs significantly from the approach of the IUCN Red List and many national red lists outside of Central Asia. Such red lists do not necessarily imply a ban on extractive use, but provide the basis for the implementation of conservation measures addressing the identified threats.

The listing criteria for Red Books have for a long time been rather unclear, and expert judgement seems to have been the main reason for listing. During the last decades, all Central Asian countries attempted to introduce a different and more transparent approach to assessing the extinction risk of species and to assign species to various categories in line with the Guidelines for Application of IUCN Red List Criteria at Regional and National Levels (IUCN, 2012). However, old procedures for Red Book listings still remain. Reversing the listing in Red Books appears to be rather difficult, causing responsible governmental agencies and/or scientists to hesitate to list huntable species in the Red Book, even in cases of sharp population declines, e.g., Saiga in Kazakhstan.

Currently exceptions, which allow hunting of Red Book species are possible in all countries based on high-level decisions, which are not predictable or transparent. Permits are issued for commercially attractive species, like Argali, Urial and Markhor and even Bukhara Deer, as well as for conflict animals, in particular Brown Bear, Snow Leopard in some countries. The lack of legal use opportunities for listed wildlife species can hinder the introduction of CBWM and other management options in cases where wildlife populations have recovered. The lack of predictable legal wildlife use opportunities can provide disincentives for conservation of the species and hamper the implementation of necessary population size control, e.g. for Bukhara Deer.

Community-based eco-tourism

There are a few examples of successful eco-tourism businesses in Central Asia, some of them are community-based and involve wildlife-watching. However, in general wildlife-watching is not yet a popular touristic activity in the region and thus developing economically viable offers can be a challenge. Difficulties and possible solutions are described in Chapter 4 in relation to focal species. In the following paragraphs legislation of relevance to CBWM without extractive use, i.e. eco-tourism is described.

In strictly protected areas (zapovedniks) state agencies are generally responsible for any kind of management. Since all land use is prohibited in such areas, including tourism in most countries, usually there are no opportunities for local community involvement. This is different in other kinds of protected areas where tourism and other human activities are allowed at least in some parts of these areas, such as national parks, biosphere reserves, etc. A unique example exists in Kyrgyzstan, where Kyrgyz legislation allows for the establishment of small protected areas, so-called 'micro-reserves' by community-based NGOs (Karabaeva, 2022). The NGOs can manage the area and profit from it by organizing touristic offers including wildlife watching.

Outside of protected areas, non-extractive use is largely unregulated in Central Asia, except for general rules concerning interactions with wildlife and endangered species more specifically. Empowering local communities to develop community-based tourism with wildlife watching outside protected areas is possible through the assignment of wildlife management areas (see 'Wildlife management in Central Asia' below). For example, a community-based NGO can apply for a wildlife management area without planning to conduct any hunts in agreement with the government agency in charge. However, the feasibility of this option is limited by several deterring factors. The main legal challenge is that the managing entity of a wildlife management area, such as a community-based NGO, is not authorized to prevent third parties from using the area for touristic purposes free of charge. This means that any managing entity must bear the costs for wildlife conservation in the area, while any competitor or individual can use the area for tourism without such costs. As a result, the CBWM organization has an economic disadvantage and needs to provide tour guiding and other services of exceptionally high quality to outcompete other service providers. Furthermore, a managing entity of such an area has no authority to regulate land use inside the area to ensure conservation of nature. In some countries the managing entity is also fully liable for poaching cases in the wildlife management area. These aspects can be obstacles for applying CBWM without extractive use.

Wildlife management in Central Asia

Management of huntable wildlife outside protected areas in Central Asian countries is typically area-based. Certain areas are identified as hunting areas and for several years the rights and responsibilities for managing wildlife in these areas are assigned by the government authorities to third parties. These are typically legal entities, which are usually commercial organizations, but can be community-based NGOs. These entities are responsible for monitoring of wildlife populations, protection of wildlife from poaching, habitat improvement and maintenance measures, and they in turn receive the right to hunt or to provide other hunters with hunting opportunities.

To fulfil these tasks, the entities holding these wildlife management areas must develop management plans and employ rangers, among other obligations. They need to apply for hunting quotas for certain species with the state wildlife management agency. This is usually required for all species of ungulates, while for other species, such as waterfowl, regulations may differ among

countries. The hunting permits obtained by the entities within the allocated quota can be sold to domestic or foreign hunters.

The procedures for getting hunting areas assigned and the modes of payment vary between the countries and have sometimes changed during the last decades. In some cases, it is just an application to the authorities in charge at the national or local (typically district) level and afterwards the conclusion of a contract. Alternatively, there may be sophisticated competitive procedures where hunting areas are determined and delineated by a special planning step (so-called mezhkhozyastvennoe okhotustroystvo) and then announced for tender. Applicants have to demonstrate their abilities to manage the hunting area in accordance with the requirements, showing their equipment and staff resources as well as experience.

In Kazakhstan also auctioning of hunting areas has been considered as an approach for their allocation. However, this attempt was abandoned, probably because of the overall low economic profitability of managing such areas in the country.

Typically, there is no payment for the use of hunting areas, i.e. no annual fee, except for a possible initial fee for covering the costs of the assignment process. But the entity managing the hunting area must make substantial investments, e.g. for management planning (so-called vnutrikhozyastvennoe okhotustroystvo), equipment, protection through ranger patrols and necessary infrastructure. Furthermore, the managing entity has to pay established fees for hunting permits within the received quotas. If no hunts are conducted and accordingly no fees are paid, the responsible authorities can consider cancelling the contract, although this usually does not happen only for this reason. The termination of a contract is more likely to happen if management activities of any kind are lacking or if poaching cases are detected in the hunting area.

In general, all managing entities are liable for poaching cases inside their management area. This can be a serious risk particularly for small, community-based NGOs and pose an obstacle for the development of CBWM.

Land use and wildlife management

Land use rights are generally separated from wildlife management rights in Central Asia, allowing for the designation and management of hunting areas independently of established boundaries of land tenure. Hunting area boundaries can thereby follow natural habitats and topographic features which is beneficial for a meaningful and sustainable management of wildlife populations.

However, this separation of wildlife management from land use means that the entity managing wildlife does not have land use rights and can therefore, for instance, not impose restrictions on livestock grazing, cultivation of crops, forestry or other activities, which may conflict with wildlife management goals. This is an obstacle for wildlife management in such areas either with or without hunting. Only a few managers of hunting areas additionally lease the land entirely or in part and are thus authorized to regulate land use.

The role of local administrations

Local administrations below the district level – subdistricts or municipalities – normally do not have any mandate or authority to manage natural resources such as forests, pastures, wild-

growing plants or wildlife. Thus, they cannot become the entities in charge of managing wildlife and hunting and often also lack capacity for this function.

An exception from this rule in the former Soviet Union countries of Central Asia is Kyrgyzstan, where the law on pastures since 2009 delegates the authority and responsibility of pasture management to the communal level self-governing body with the obligation of setting up local pasture committees. These pasture committees might be formally able to become wildlife management entities or holders of hunting areas, but this has not been practiced so far. This is likely because of the mismatch between large hunting blocks needed for meaningful management of wildlife and the much smaller community pasture units.

In Mongolia, local administrations on community level ("soum") are involved in the management of huntable wildlife within their jurisdictions. According to Amgalanbaatar (pers. comm 2022) in most cases, communities jointly manage hunting areas. However, this does not provide these communities with substantial income for conservation and other purposes. The reason is that other governmental funding is apparently cut at the level of expected hunting income. If planned hunts do not take place, the budget of a soum is nonetheless cut, and such budget cuts are considered as the fault of the respective soum leaders (Amgalanbaatar, pers. comm. 2022).

Applicability of international examples of CBWM for Central Asia

The approach of community-based conservancies as explained for Namibia in Section 3.3.2 inspired the development of community-based wildlife management in Central Asia. However, the situation in Central Asia differs significantly in terms of the lacking linkage between land use and wildlife management rights and of the lower authority of local self-governing bodies. Since the subdistrict administrations currently lack capacity and authority to manage wildlife, local NGOs can be considered as potential entities to set up community-based wildlife management in Central Asia.

Preferably, such NGOs should be rooted in the local community, have democratic governance mechanisms and provide for an equitable sharing of benefits and costs in the community. Achieving full participation of all community members, i.e. of all households in a village, group of villages or municipality is very difficult as typically only some local people are interested in hunting and in getting involved in this specific type of natural resource management at least initially (see Section 3.4.1 for possible reasons).

Furthermore, local people interested in hunting and wildlife management often do not want to have a representation of everyone in the institutional structure set up for this purpose. The common argument is that this would remind too much of a kolkhoz, i.e., a Soviet collective farm, meaning this would lead to insufficient ownership and a mentality of maximizing individual gains at the expense of a common resource. Closely related to this perception by some local stakeholders is the big variation in the levels of social cohesion found in rural communities across Central Asia. For instance, in the Western Pamirs of Tajikistan, local people in mountain villages often show a strong sense of community feeling, cooperating in many areas of joint interest and being involved in community-based organizations for local development. In other regions, in particular, where the population of villages has been changed during the Soviet history by forced resettlement and influx of people from other areas, the interests of individual households may differ so that no common interest and cohesion can be identified.

Another difference to the Namibian example is the lack of automatic connection between land use rights and wildlife management in Central Asia. The people interested in wildlife management and hunting are normally also land users of the respective area, but rarely have

land use rights over larger sections of their hunting areas. Therefore, establishing good relations between wildlife management entities and land users in these areas is essential.

For these reasons, so far in Central Asia community-based wildlife management is organized either through NGOs formed by people of common interest in managing wildlife in a certain area or through small family enterprises. The NGOs in charge of hunting areas are legally obliged to use the generated income exclusively towards the objectives laid out in their respective statutes, which would typically include conservation and management of wildlife and its habitats as well as local social and economic development. In NGOs, which are rooted in local communities, peer pressure and informal control by other community members cause some accountability also beyond the immediate members of the NGO.

In contrast, local family enterprises are not required to invest in conservation and common welfare, as they are business structures and act in their own interest. However, these enterprises are often under some peer pressure and may have informal social obligations towards the entire community. This peer pressure is exacerbated if other families have land use rights in the areas where such family enterprises manage wildlife. In general, at least a part of the money generated by such family businesses is in practice used for social and economic development while other benefits for the community include the employment of community members and the purchase of local services (for more details see 3.4.3-3.4.5).

For all community-based entities it is crucial to get authority over wildlife management in their areas of interest and to get legal access to critical wildlife resources. As shown below in the country-specific Sections 3.4.3-3.4.5, such processes can take many years during which these people often already protect wildlife on a voluntary basis or with provisional agreements with the government agencies in charge.

Depending on the wildlife species inhabiting the respective areas and the specific legal situation, hunting quotas might not immediately be allocated or only for certain species. In such situations a strong sense of ownership, some intermediate funding sources and where possible non-extractive forms of use or the use of other species are needed to bridge these periods.

Concluding, the legal and institutional frameworks in the Central Asian countries offer some opportunities but also bear obstacles for the development of community-based wildlife management. Full community ownership is not supported by the existing arrangements, but forming NGOs and small family-based businesses nested in the local communities are options for local communities to gain authority and responsibility for wildlife management. These structures can be set up in a way that enables sharing benefits from wildlife management at the local level. The right for wildlife management is allocated independently of land use rights, and this can cause difficulties in aligning wildlife management with other forms of land use. Finally, the actual hunting by the holders of hunting areas is subject to quota and allocation of permits from the government, which provides for more state control, but limits the ability of local communities to make management decisions.

3.4.3 Tajikistan

After having discussed the general legal framework across countries of Central Asia, this section describes specific examples of CBWM approaches, including the successes achieved as well as setbacks. Reasons for setbacks are discussed.

Creation of community-based NGOs for wildlife management

In 2008 the Tajikistan Mountain Ungulates Project started with support from GIZ and foreign conservation NGOs, in particular ZGAP. This project initiated a facilitation and empowerment process within selected valleys of the Pamirs aimed at traditional hunters and other community members interested in the sustainable use of wildlife (Michel & Rosen, 2024). Pilot sites were selected, which community members could potentially control, and which were large enough to host at least a few hundred Asiatic Ibex. A participatory analysis and planning process involved local people, in particular informal hunters (i.e. people with hunting experience but not in possession of a hunter's license; Figure 19) and helped them understand that past declines of Asiatic Ibex and Argali were a direct effect of unregulated and intensive hunting. The local people soon recognized that continuous pressure prevented the recovery of ungulate populations, thus also reducing their own hunting opportunities. As the main reason for this situation, they identified the fact that they lack authority to prevent poaching by fellow community members and by outsiders.

Figure 20: Impressions of community facilitation. Bartang valley, GBAO, Tajikistan. Photo: Michel

Having become aware of the opportunities provided by the legislation of Tajikistan (Section 3.4.2), these local hunters established their own community-based NGO and applied for getting the areas used by their communities assigned as a wildlife management area.

The first of such community-based NGOs was registered in November 2008 and acquired land use rights over 470 km² assigned by the authorities of their administrative district. Soon after, the State Committee on Environmental Protection of Gorno-Badakhshan Autonomous Oblast (GBAO) Region recognized the active members of this NGO as volunteer game wardens. The State Forestry Agency in September 2011 assigned the rights and responsibilities for wildlife management in this area to the NGO.

Following this first example, other communities established similar organizations and applied for the assignment of wildlife management areas. Some attempts to establish such community-based wildlife management were unsuccessful if sufficiently energetic organizers were lacking in the communities, private concessionaires had already been assigned the rights, or areas were not suitable. The wildlife management areas officially assigned to five such community-based NGOs cumulatively covered 3,455 km² by the end of 2021 plus approximately 1,000 km² within Tajik National Park. These NGOs together had about 60 volunteer rangers, who protected and managed wildlife (Michel & Rosen, 2024).

The statutes of these NGOs included the conservation and sustainable use of wildlife species in designated areas, eco-tourism, and support of the well-being and development of the communities. As any NGO, these organizations were established as non-commercial entities, meaning that any earnings could be used for conservation and community-related expenses only, and had to be organized by certain democratic principles with decision-making by a general assembly, transparency in use of funds and election of chairpersons and board members. These NGOs then applied for the allocation of suitable hunting areas in the vicinity of their villages. Once having started the establishment of legally recognized control over the areas used by them, the members of these NGOs prevented other community members as well as outsiders from poaching, and after recovery of the Asiatic Ibex and Argali populations started regulated use, based on surveys and agreed quotas (Michel & Rosen, 2024).

A successful example for such an NGO was the NGO Burgut, which was registered in 2013. In the same year the district administration assigned a hunting area of almost 93,000 ha to this NGO until 2018 for the "purpose of protection, increasing and rational use of natural resources including wildlife, fauna and flora and other resources, recovery and increase of wildlife populations which are subject to hunting or threatened by extinction, protection of historical sites, highlands as well as carrying out humanitarian activities". In recognition of the conservation achievements and social benefits provided by the NGO this decision by the district administration in 2018 was extended for another ten years. Although the Argali population size during the recorded period did not reach the same level and density as populations in better habitat managed by commercial concessions, it reached a level sufficient for allocating a modest hunting quota. First, Asiatic Ibex permits became available from 2014 onwards, but only in 2017 one Argali permit was issued because the commercial concessions used their de facto monopoly on Argali to prevent the allocation of a quota to this NGO. In Tajikistan the quota is distributed to the hunting enterprises, i.e. concessionaires holding wildlife management areas with Argali, through the "Association of Hunters of Tajikistan", which can therefore prevent other stakeholders from access to permits.

As potential alternative to the creation of new community NGOs, the integration of CBWM into existing community-based non-governmental organizations (Village Organizations and their associations at the jamoat level) with full representation of all households of the respective

communities was considered. But these organizations did not see conservation, wildlife management and hunting as part of their mandate, and traditional hunters had no interest in integrating "their resource" in a broader institutional context dominated by actors neither interested in wildlife and hunting nor publicly recognizing traditional hunters as a legitimate interest group.

With support from the International Council for Game and Wildlife Conservation (CIC) and other international NGOs, the community-based NGOs established an association in 2015, the Association of Nature Conservation Organizations of Tajikistan (ANCOT). ANCOT supported the development of community-based wildlife management in all aspects including capacity development, fundraising for special projects, marketing of nature-based and hunting tourism, and logistical support of tourism operations.

Family enterprises for wildlife management

Within the Markhor range, lots of wildlife management entities developed differently from the ones in the Pamirs. In the south-western corner of Darvaz district a former informal hunter had already established his own family enterprise and had leased an area of more than 35 km² as pasture, when the Tajikistan Mountain Ungulates Project started in 2008. At this area, he together with his relatives had started to protect Markhor and other wildlife from poaching. Similarly, another local family had established its enterprise and leased pastures west of Dashtijum Strict Nature Reserve in neighbouring Shamsiddin Shohin (at that time Shuroabad) district.

Recognizing the shortcomings of enterprises in terms of participation and benefit sharing, the project in 2009 facilitated the establishment of a local NGO, involving informal hunters and other interested inhabitants from the main remaining parts of the Markhor range area. This NGO faced internal and external conflicts soon after its establishment. As a result, several informal hunters with their families established their own enterprises and finally also the NGO transformed into a company (LLC). By 2017 the Markhor range areas have been assigned to five organizations based in local communities plus one company held by an outsider (Broghammer et al., 2017). Since then, splitting of existing enterprises and the appearance of further external actors have caused a continued increase in the number of involved entities and the creation of more, but smaller wildlife management areas (Herrero et al., 2022, unpublished report). The family enterprises originally also wanted to join ANCOT, but current legislation does not allow joint associations of commercial and non-commercial entities. However, most of the family enterprises also closely cooperated with ANCOT.

Revenues from wildlife management

The local game management entities – NGOs or family businesses – had in common that they did not receive financial support from the above-mentioned project for paying salaries, but they did receive assistance in institutional development and equipment funded by the German government and by foreign NGOs. For the initial period game management entities relied on voluntary work, partly carried out in combination with other activities in the mountains, like herding of livestock, or (in the case of some enterprises) on income from other sources.

In the NGO-managed hunting areas in the Western Pamirs the first trophy hunting trip took place in 2012, and for the first time, members of the local NGO and the community earned legal income from wildlife use, as well as meat and invested in a micro-credit scheme. Since that time numerous hunters and wildlife tourists have visited this and other areas managed by local NGOs.

During six years in total around 100 Asiatic Ibex were hunted by tourists in five conservancies. The hunters paid 5,000 USD per hunt including the permit and all services. The net benefit for the local NGO was 3,000 USD per hunt. These revenues were used for funding conservation activities, in particular year-round protection, for lease of pastures, which are critical habitat for Argali and Asiatic Ibex to reduce competition with livestock, and for the socio-economic well-being of the communities by investing, for instance, in batteries for solar electricity of a local hospital, a playground for children, schoolbooks, the repair of local infrastructure and support of poor families. The provision of local services, in particular hosting of tourists in homestays, generated income for NGO members and other families.

The wildlife management areas in the Markhor range during the first years mainly relied on income from hunts on wild boar, which is a common species in the area and not hunted by locals, so that many old boars with large tusks can be found. From 2014 onwards, legal Markhor hunting tourism generated more substantial income. By 2022 about 100 Markhor had been marketed at around 100,000 USD per animal, of which after deduction of permit fees and other expenses about 60% reach the family enterprises and are used for the operations of the wildlife management areas and for necessary investments into these. This income is complemented by nature tourism offers especially for wildlife photographers. The enterprises have agreed that at least 30% of their revenues should be invested into local social and community development. While the actual figures are not publicly available, there have been several substantial investments, e.g. into water supply for households and irrigation, sport grounds, housing for flood-affected families and more.

Figure 21: Only a few tourists are coming for yak rides in winter. Alichur, Tajikistan. Photo: Caldwell.

Positive conservation outcomes

Community-based wildlife management approaches as described above achieved positive outcomes in Tajikistan in terms of establishing sustainable organisational structures, adequate area coverage, and positive conservation impact on target species while attaining community benefits. Furthermore, this approach was communicated and perceived as a positive development further strengthening Tajikistan's reputation internationally as destination for sustainable hunting and nature tourism. The IUCN SSC Caprinae Specialist Group has assisted or led surveys on mountain ungulates, most notably on Markhor to support the population monitoring efforts. Survey data from direct counts by scientists from supporting NGOs and traditional hunters were additionally used to prepare quotas for trophy. The basis for quota setting was 1 male ungulate to be taken per 100 animals recorded, if at least 5 males are estimated to be older than 8 years.

A good example for positive impacts is again the NGO Burgut in Tajikistan. Commercial concessionaires considered the area unattractive due to high human pressure, the difficulty of protection against poaching and the low potential for the development of a considerable population of Argali and Asiatic Ibex (Figure 21). It was managed by an experienced hunting guide and former informal hunter, who involved the community members interested in hunting in the organization. Despite the presence of many herders in all valleys of the area and easy access for poachers from the highway passing to most valleys, the NGO members in collaboration with other community members managed to increase the ungulate populations substantially by putting protection measures and land use restrictions in place (Figure 22). However, these trends in wildlife population numbers should be treated with caution, because of varying survey frequency since the establishment of community-based conservation, variations in survey effort, and detectability of the animals. The latter may improve within a few years as a response to reduced poaching pressure, making the animals less wary and easier to record.

In other areas in Tajikistan managed by local communities via an NGO it was possible to demonstrate that the numbers of Asiatic Ibex and Markhor increased significantly. Recorded Asiatic Ibex densities in three areas in the western Pamirs and Wakhan reached 0.5 to 1.44 per km² conservancy area. The number of Markhor also increased substantially from perhaps below 500 in the early 2000s to directly recorded 1,018 in 2012, >1,901 in 2017, and more than 5,000 in 2022 (Michel et al., 2015; Broghammer et al., 2017; Akramov et al., 2022).

Challenges and failures

Despite some successes, application of CBWM in Tajikistan suffered a serious setback in 2022 mainly as the concept is perceived as a competitor to commercial hunting-based business models.

CBWM was essentially established as a complimentary approach to commercial hunting tourism activities in Tajikistan. It was piloted in areas, which are less suitable for the commercial privately-owned concessions and therefore often had not been assigned to any other legal entity for a lack of interest. The community-based approach was not intended to replace privately managed concessions. Nevertheless, several hunting concessionaires developed a hostile attitude towards community-based initiatives and the supporters of the approach. In the early years they expressed negative views on the chances of success of community-based approaches, describing the local informal hunters as notorious poachers, who would never be willing and able to protect and sustainably use wildlife, or assessing the potential of the pilot areas for recovery of ungulate

Figure 22: Asiatic Ibex (left) and Argali (right) in the CBWM area of NGO Burgut in the Eastern Pamirs, Tajikistan. Photo: Atabaev (left), Caldwell (right).

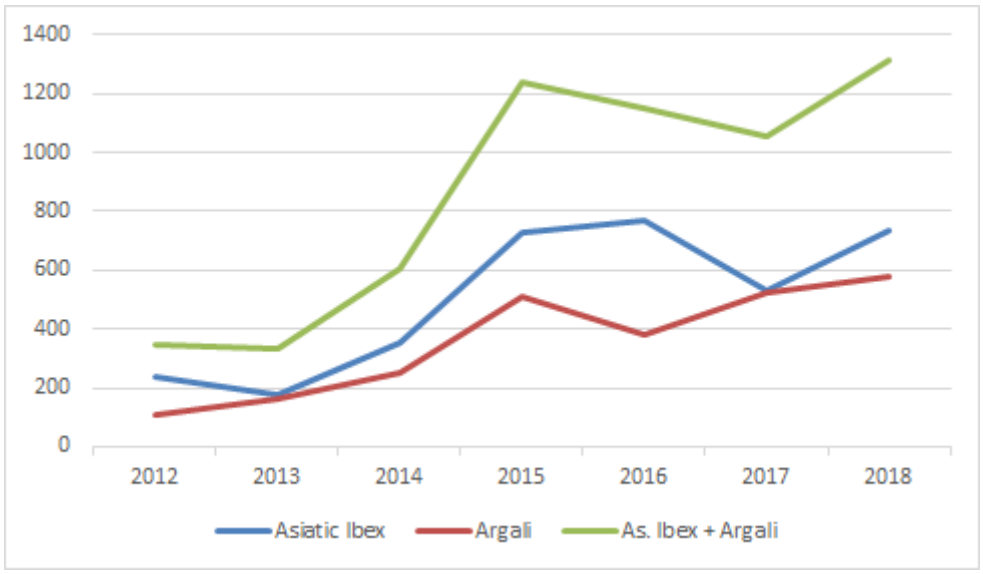

Figure 23: Development of recorded ungulate population numbers in the CBWM area of NGO "Burgut" in Tajikistan. Data: ANCOT

populations as negligible. Furthermore, some concessionaires reportedly had been involved in illegal trophy hunts, e.g., of Markhor. They regarded the empowerment of local informal hunters and their conversion from poachers to legal wildlife managers as a threat to their business.

As the success of community-based wildlife management increased with growing wildlife populations, tangible benefits for local communities were being achieved and local people started supporting CBWM initiatives. This led to the perception of some commercial hunting concessionaires that their own interests were being compromised by the non-profit organizations. These hunting concessionaires started to threaten representatives of the community-based projects. Some even tried to use their economic and political power to put pressure on the community-based NGOs and their representatives, e.g., by instrumentalizing tax and law enforcement authorities.

Figure 24: Male and female Argali in Alichur, Tajikistan. Photo: ANCOT.

Furthermore, in 2022, following anti-governmental protests in the Pamir region of Tajikistan and their suppression, the political situation in the country has become difficult for any type of NGO. By the end of 2022, most community-based NGOs for wildlife management were formally shut down by the state security service and thus the assignment of hunting areas as wildlife management areas to these NGOs was terminated. For instance, already during recent years the NGO Burgut neither received permits for Argali nor for Asiatic Ibex. Increasingly the NGO and its leader came under pressure by various authorities, obviously caused by actors interested in the commercial use of Marco Polo Argali, and in 2022 the wildlife management area was reportedly reassigned to the holder of a commercial concession and in July 2022 the NGO was shut down by the regional administration (pers. comm. local stakeholders to S. Michel, 2022). With its member-NGOs being closed, ANCOT stopped functioning as association and on its basis a new national-level conservation NGO was created with a different mandate.

Thus, by the time this report was published, the approach of community-based NGOs as responsible entity for wildlife management is no longer functioning in Tajikistan and its prospects are unknown. This is particularly disappointing as the previous success of this approach not only has achieved remarkable conservation impact and contributed to the well-being of local communities but had also enormously enhanced Tajikistan's international reputation in the fields of sustainable wildlife use, conservation and tourism.

On the positive side, the family-based small enterprises continue their work in the markhor areas and the former members of two NGOs established new small enterprises in their respective communities for continuing their activities. However, in the Markhor areas some external actors used economic power and political connections to get small sections of wildlife management areas assigned, previously managed by local family-based enterprises. They use these areas for obtaining a Markhor quota while relying on the conservation success achieved by the local area managers in larger areas and not or marginally investing in conservation and local development.

This elite capture of small game management areas and associated business opportunities may also affect the motivation of local people and thus the sustainability of Markhor conservation. Such affronts against groups and individuals, who have worked for a successful recovery of wildlife resources, are governance failures, which seriously hamper the motivation of local people to get involved in any form of CBWM.

The examples from Tajikistan show that the current legislation already provides for the successful implementation of CBWM approaches, giving the responsibility and authority for conservation of huntable wildlife to local communities in the form of NGOs or family businesses. These entities were initially successful in terms of conservation results and economic viability, until the situation changed due to political reasons. Under the specific circumstances of Tajikistan with a highly commercialized hunting tourism sector, no enabling conditions for local NGOs, the application of CBWM remains extremely challenging.

3.4.4 Kyrgyzstan

The following section describes the introduction of CBWM in Kyrgyzstan using several examples, detailing the achieved results as well as challenges and prospects.

In Kyrgyzstan, in the framework of a project by the NGO Snow Leopard Trust (SLT) marketing of local handicrafts from communities in the Snow Leopard range under the condition that no poaching would be tolerated by the community has been successful in generating local income and motivating the involved communities to adhere to conservation rules. SLT markets the products through “Snow Leopard Enterprises”. However, this approach can rather be regarded as support of the creation of alternative livelihoods than of CBWM as there is no authority and responsibility for managing wildlife assigned to community members.

Creation of community-based NGOs for wildlife management

Piloting of the CBWM approach started in Kyrgyzstan in 2011 with an assessment of its potential supported by the GIZ Regional Programme "Sustainable Use of Natural Resources in Central Asia". With the help of this Programme the NGO "Ak Terek" facilitated the establishment of two NGOs of local hunters in Kemin district of Chui oblast and in Aksuu district of Issyk-Kul oblast. Already in 2010, the same Regional Programme had started to assist the Kyrgyz Republic in developing a new law “On hunting and game management”, which was adopted by the Parliament in 2014 and since then has provided an adequate wildlife management framework for commercial concessions as well as for NGOs established by local communities.

In 2014, the Snow Leopard Conservation Programme of the international NGO Panthera and its local partners started to mobilize local hunters in three communities of the Alai valley in the Alai and Chon-Alai districts of Osh oblast. The experience of Tajikistan was instrumental in triggering the development of community-based wildlife conservation in Kyrgyzstan. Representatives of a community-based NGO from Murghab district of GBAO, Tajikistan, which had partly been founded by ethnic Kyrgyz, assisted in facilitating the creation of similar local NGOs in the Kyrgyz Alai valley close to the border with Tajikistan. The involvement of people of the same ethnic background and with similar experiences and interest for wildlife management from Tajikistan, who were at that time successfully protecting and rehabilitating wildlife, motivated local people in Kyrgyzstan.

After the first local NGOs were established in 2011 and 2014, a national level NGO “Ilbirs Foundation” evolved, which became instrumental in supporting the institutional development of

these NGOs and the overall replication of CBWM. Several local initiatives of informal hunters and other interested community members emerged, some of them leading to the establishment of new local NGOs. By 2021, there were nine community-based non-profit organizations for wildlife management (Table 6). Most recently, in the context of the UNEP programme "Vanishing Treasures" another community-based NGO "Jashyl Oroon" emerged in Toktogul district of Jalalabad region. At the same time, one additional NGO has dissolved as their area of interest has been designated as protected area.

Table 6: Overview of CBWM NGOs, size of managed areas and type of agreement.

NGO	Region	Area	Contract
Shumkar-Tor	Chon-Kemin, Chu	20,000 ha	Temporary agreement
Chunkur-Tor	Ak-Suu, Ysyk-Köl	87,000 ha	Temporary agreement
Baiboosum	Ysyk-Köl	14,000 ha	Temporary agreement
Ak-Bulun Eko	Ton district, Ysyk-Köl	150 ha	Temporary agreement
Ala-Too Bugu	Zakaznik Chon-Jargylchak; Ysyk-Köl	24,000 ha	Temporary agreement
Sook	Kochkor, Naryn	48,666 ha	Temporary agreement
Kara-Kuchur	Kara-Kuchkur and Kochkor, Naryn	213,382 ha	Game mgt. area
Janaydar	Alai valley, Osh	157,256 ha	Game mgt. area
Bek-Tosot	Alai valley, Osh	180,807 ha	Game mgt. area
Jashyl Oroon	Toktogul, Jalalabad	250,000 ha	Temporary agreement
Total		**995,261 ha**	

Relevant changes in the legislation of Kyrgyzstan

A key element of the new law "On hunting and game management" from 2014 is the territorial principle of hunting. It implies that hunting is only allowed in areas which are assigned to a legal entity. This entity has the right and responsibilities for all elements of hunting management at the given territory. Assigning hunting areas to legal entities is based on a competitive process, which takes place every few years in each region. The hunting areas are determined by a special unit of the Ministry of Natural Resources, Ecology and Technical Control (previously under the State Agency for Forestry and Environmental Protection).

Until 2015 assigned hunting areas were often too small for meaningful management, and as a result, hunting enterprises received quotas that were too low for being economically viable and fragmentation of suitable areas caused difficulties for an effective protection from poaching and control of area boundaries during hunts. To address these issues, in recent years the sizes of newly delineated hunting areas were increased and are now up to several hundred thousand hectares even in landscapes with numerous communities and naturally distinguished potential wildlife management units. However, these hunting areas are used by numerous villages for livestock grazing and other land uses, making it difficult for community-based organizations to apply successfully for such areas and to establish their management in an inclusive way.

Figure 25: Community workshop in Taldy-Suu, Alai valley, Osh region. Photo: Michel

Positive outcomes and challenges

For the period until the public tender process on the assignment of hunting grounds, the respective government agency (formerly Biodiversity Department of the State Agency on Forestry and Environmental Protection, currently a unit of the Ministry of Natural Resources, Ecology and Technical Control) made temporary agreements with community-based NGOs about their involvement in wildlife protection on a voluntary basis. While these temporary agreements do not allow any extractive use of wildlife, they provide the right to prevent illegal hunting by outsiders, to guide nature tourists and to carry out wildlife population monitoring. These activities by the NGOs already showed positive outcomes.

For instance, Argali was considered locally extinct at the area of the NGO Janaydar, as neither direct observations nor camera traps confirmed its presence. Since 2014/2015, its rangers irregularly observed tracks attributed to Argali. In August 2021 a herd of 34 Argali and again in September four Argali were observed by local people on summer pastures on the northern slope of the Zaalai Range. A similar result was achieved for Asiatic Ibex: During a survey in 2015 only 33 Asiatic Ibex were detected, while until 2021 the number rose to 378. In the neighbouring area Bek-Tosot in the Alai valley, also protected since 2015, surveys of Asiatic Ibex showed an increase from 111 animals in 2015 to 504 in 2021.

In the area protected by the NGO Shumkar-Tor in Chon-Kemin the records of Roe Deer increased from 33 in 2013 to more than 250 in 2020. Maral Deer has been absent from this area in 2011 and have in the meanwhile reached numbers of around 50 individuals due to natural recolonization. After years of absence of Maral Deer in the area of Ak-Suu (Ysyk-Köl region) managed by the NGO Chunkur-Tor they returned after the establishment of community-based

control by traditional hunters. During a meeting in 2013, a member of this NGO, being asked for the reasons for the return of the Maral, explained that “simply we were those who have poached the Maral, and we are now protecting them”.

In the area Kara-Kuchur, already one year after establishing protection by the local NGO of traditional hunters in 2020, the first 20 Asiatic Ibex were detected after long absence, despite intensive use of the area for livestock grazing. These observations provide reason for hope that the NGOs will be successful in Argali conservation in these areas.

While most of the above-mentioned community-based NGOs still act on the basis of temporary agreements with the respective government agencies, three of them have already been assigned wildlife management areas in recent years. These are two areas in the Alai valley, both assigned in 2020 to the NGOs Janaydar and Bek-Tosot. Furthermore, in 2021 the NGO Kara-Kuchur, established in 2020 with facilitation by Ilbirs Foundation and financial support by the German Nature and Biodiversity Conservation Union NABU, got assigned a wildlife management area. However, no hunts have been conducted yet due to the hunting moratoria imposed by decision of the Government and pending or only recent official assignment of hunting areas and/or time needed for population recoveries. The conservation and anti-poaching work are currently supported by local and international NGOs and through limited income from tourism (Michel & Rosen, 2024). The moratorium in Osh region phased out in 2023, so that first hunts might become possible for the two NGOs located in the Alai valley. In Naryn region, a moratorium is implemented from 2023 till 2025, which does however not affect the NGO Kara-Kujur as time is needed for the recovery of wildlife populations in the area managed by this organization before hunting can be considered.

Figure 26: Wildlife survey in community-based game management area. Photo: Kubanychbekov

The NGO Shumkar-Tor, which originally planned to implement CBWM with extractive use of wildlife has been especially successful in establishing wildlife-based tourism. Their area is visited by hundreds of domestic and foreign visitors, causing this NGO to consider not to start hunting at all. Although most NGOs hope to get wildlife hunting rights, three community-based NGOs "Ak-Bulun Eko", "Baiboosun" and "Ala-Too Bugu" work in protected areas, where no hunting is neither permitted nor planned. In these cases, non-extractive use for nature-based tourism is the major driver for the engagement of the local communities. However, such tourism initiatives can only be economically viable in rather popular areas. In most areas the number of tourists and earned revenues are small compared to potential revenues from hunting tourism and to other sources of income. The community-based NGOs involved in nature-based tourism do not necessarily benefit most from the money spent by the visitors and the linkage between revenues from tourism and protection of wildlife can be missing, particularly if wildlife watching is not a major attraction of the area.

A number of examples show that the overall approach first piloted in Tajikistan could successfully be replicated and adapted to the conditions of Kyrgyzstan with differences and commonalities. Several community-based NGOs were created in Kyrgyzstan and demonstrated an impressive commitment by continuously working for wildlife conservation and the prevention of poaching over many years even without the prospect of actual hunting taking place in the short term. A combination of ownership feeling, support and recognition by the national-level NGO Ilbirs and its international partners, some income from tourism and the perspective of hunting opportunities in the future contributed to their lasting motivation. Some NGOs were also not interested in hunting, but established community-based ecotourism businesses, in areas attractive for tourists.

3.4.5 Kazakhstan

Community-based approaches of wildlife management and conservation have been trialed in Kazakhstan to a lesser extent than in Tajikistan and Kyrgyzstan despite suitable wildlife, large areas with low human population density and hunting being a part of the national traditions and folklore. This section provides an overview of first attempts to introduce CBWM. As the application of the approach is still in its initial stages, we present the first steps, progress made so far and prospects.

Wildlife management by an NGO without hunting

The national level NGO Association for the Conservation of Biodiversity of Kazakhstan (ACBK) piloted the approach of getting hunting areas assigned for managing them as protected areas. In 2009, ACBK was assigned two wildlife management areas ("Saga" and "Altybai") of 3,400 km² in size and has since then been managing them as private wildlife reserve without hunting. The major purpose of creating these NGO-managed protected areas has been the conservation of steppe wildlife and landscapes of conservation value with a particular focus on the protection of Saiga Antelopes from poaching in critical habitats. Currently the whole area is branded as "Ecological Park Alty-Say" to make it attractive for non-extractive use, like tourism (Figure 26). According to the Kazakh legislation, the entity holding hunting areas is responsible for preventing poaching at the hunting area, even if there is no hunting taking place. Given the large and difficult to control areas, this can be a considerable challenge. ACBK detected and reported some poaching cases and was consequently held liable, which has led to a long and difficult legal

procedure. This situation set a precedent substantially deterring other organizations from replicating this approach.

Figure 27: Rangers of the Ecological Park "Alty Sai". Photo: A. Timoshenko

Despite these difficulties, ACBK succeeded to increase the number of wildlife and developed some nature tourism in this area. Due to the remote location, this would typically be part of a larger tour to the steppe of central Kazakhstan, crossing also the "Ecological Park Alty-Say". The local people in one of the villages have provided accommodation and food to the tourists and helped with associated logistics. Local people benefit also from employment opportunities as wildlife rangers. However, since the income generated is low compared to the costs of wildlife protection, the wildlife management area is dependent on financial support from international NGOs and other partners of ACBK.

Wildlife management by a community-based NGO

Another example from Kazakhstan is also related to Saiga. The situation of the Ustyurt population of Saiga, the smallest population in Kazakhstan, has been particularly worrying around the year 2015 (see Section 2.2.1). A small number of illegal hunters from some villages seemed to be responsible for a substantial poaching pressure with a small income received from this illegal and dangerous activity (Kühl, 2008). This gave reason for considerations by the German Nature and Biodiversity Protection Union (NABU) to replicate experiences with establishing community-based NGOs in Kyrgyzstan and Tajikistan for this Saiga population. Although local people hesitated to talk about Saiga and poaching and views prevailed that Saiga was the sole responsibility of the state and the state wildlife ranger service Okhotzooprom, some people showed interest in getting involved. Several visits to the area and the involvement of an experienced facilitator of community-based wildlife NGOs from Kyrgyzstan led to the

establishment of a first NGO in the west of the Ustyurt Saiga range in 2017. But as the head of the local district administration (the akim) was against this new development, he tried to convince local people to shut down this NGO. An application by this NGO in 2018 to get two advertised hunting areas in the core range of the Ustyurt Saiga population assigned was also unsuccessful. Only with the change of the district akim a few years later the local NGO leader regained confidence and restarted mobilizing other villagers.

As a next step, NABU with the support of the Advisory Assistance Programme (AAP) for environmental protection of the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection facilitated the establishment of two community-based NGOs by local people in the east of the Ustyurt Saiga range in 2019. In 2020, the local NGOs formed the association “Tabigi Orta”. The NGOs and their association further received support for equipment and operational expenses. Other local initiatives can join this association. It has started successful cooperation with various stakeholders including the Nature Protection Police and established a joint voluntary inspection. Members of Tabigi Orta’s NGOs and its voluntary inspection have contributed to protection of Saiga from poaching through patrols and by influencing other villagers (Figure 27). In 2022, Tabigi Orta applied for other advertised game management areas at the Ustyurt Saiga range and was successful. As a result, the organization now manages an area of 4,600 km², where it aims to develop sustainable hunting as the source of income for area management and for community benefits.

Figure 28: Joint patrol at the Ustyurt by Nature Protection Police, Territorial Inspection and NGO Bayan-Shagan. Photo: Michel

Conservation-oriented hunters and outfitters have already expressed interest in Saiga hunting in this area, if this will become possible in the future. As the Ustyurt population of Saiga is the smallest population in Kazakhstan, the quotas for Saiga hunting here are likely to be small if hunting is permitted in the near future. Nevertheless, even hunting tourism based on these

limited quotas (e.g. starting with about 10 males per year) can likely generate sufficient income to raise the motivation of the local people to conserve Saigas and provide community benefits.

Concluding, the first experiences in Kazakhstan show the potential of applying community-based wildlife management and conservation approaches even for a highly mobile species using large areas as habitat, like Saiga antelope. Pilots of the management of hunting areas by NGOs have successfully been initiated and the legal framework would allow for the application of this approach also in other areas and for other huntable wildlife species.

4. Feasibility of establishing community-based wildlife management for focal species

Indigenous peoples of Central Asia have historically been living with and managing wildlife. However, the role of local people and traditional approaches in wildlife management has become only marginal in the course of the last two centuries. In the Soviet period formal legislation and institutional structures for wildlife conservation and management were established, favoring centralized decision-making without significant involvement of local communities. These approaches serve as the basis for wildlife conservation and management in Central Asian states still today. Currently, models with a greater involvement of local communities are being considered and have already been applied in some of the countries. Having discussed legal obstacles to establishing CBWM with and without extractive use and possible solutions in Chapter 3, we now describe practical considerations for strengthening the involvement of local communities through CBWM for each of the focal species in Central Asia.

4.1 Saiga Antelope

The relationship between people and Saiga has become problematic recently within the ranges of the largest populations in Kazakhstan, particularly the Ural Saiga population. Its size has reached a historical maximum since regular population surveys had been initiated in the 1950s (see Section 2.2.1). People living close to Saiga complain about large herds of Saiga destroying pastures and hay-making plots. Many such complaints were made on social media, causing the Government to openly discuss regulating Saiga numbers (Tengrinews, 2022; Informburo, 2022), in autumn 2023 finally taking the decision to cull Saiga.

To date, Saiga continues to be protected by state rangers, but no proper Saiga management system has been put in place that would address issues related to the growing number of animals including using the species sustainably, generating benefits from Saiga presence and mitigating the human-wildlife conflict. The management of migratory species like Saiga with unstable movement patterns and habitat use is a difficult task (Table 4). Several guidance materials have been developed under CMS to support the development of a Saiga management system, which include ways of involving local people in Saiga management (Milner-Gulland et al., 2020; CMS, 2023).

The conflict between humans and Saiga will likely intensify as the Saiga populations continue their growth at high rates if no mitigation measures are implemented. Apart from their involvement in public consultations, local communities have not been formally involved in any management decisions and only marginally benefitted from Saiga-watching tourism activities at a few places. Considerations about involving local communities in Saiga management are therefore very timely. Empowering local land users to influence management decisions can enable them to develop a feeling of ownership for the animals, and to benefit from their presence. This would support positive attitudes towards Saiga and its managers and mitigate conflicts. We therefore assess here several options for the involvement of local communities in both non-extractive and extractive use of Saiga. Decisions about such involvement will likely require gathering data on the current situation to understand the potential and risks and to estimate conservation impacts of each option. When piloting the selected approaches, their effect should be monitored, and the management adjusted, if needed.

4.1.1. Non-extractive use

Touristic activities like Saiga watching or photography are described as the non-extractive use of Saigas. The following section provides an overview of such tourist offers in Saiga Range States and discusses the feasibility of developing Saiga-based tourism with involvement of local communities.

While not everybody would regard Saiga as a beautiful animal, both its peculiar appearance and large herds of animals in wide, open steppe landscapes make them an attractive object for tourists, coming from Kazakhstan or from abroad, especially since many people, even those living in Saiga Range States have never seen a live Saiga. The fact that Saiga cannot be seen in any zoo except for a few animals in Almaty Zoo increases motivations to see them in the wild, as there is no other way to see these animals for most people.

However, there are some challenges for organizing Saiga-based tourism. First of all, Saiga Antelopes occur in very remote places, usually requiring long trips by car. This is potentially a significant obstacle, as a lot of time is spent on driving instead of wildlife watching. It is almost impossible to transport larger groups of people to the Saiga range as road conditions do not allow the use of usual vehicles, like buses. Secondly, tourism infrastructure is usually not available at these places. Accommodation is only possible in rather uncomfortable conditions camping in the steppe or sometimes in the homes of local people. In most cases, significant amounts of equipment, water and food need to be brought to the destination close to the Saiga habitat, making the arrangement of such trips costly. Economic viability can thus only be achieved through higher prices, which in turn decreases the attractivity of Saiga-based tourism.

A feasibility study needs to be prepared, which would identify suitable locations for developing Saiga-based tourism. Significant investment in infrastructure may be needed even in the most promising locations in order to develop touristic offers and to attract visitors. Another challenge is the migratory behavior of Saiga, which makes it difficult to predict when the animals will be at a certain part of their range. Often it is necessary to define a location for a tour in advance, but one cannot guarantee that there will be Saiga at the site upon arrival. For the vast range of the Betpak-Dala population, for example, this is likely to be an issue. And finally, it is a challenge to ensure that local people from the Saiga range actually receive sufficient economic benefits from Saiga tourism to generate incentives to support and apply CBWM approaches (see Section 3.4.2).

Despite these practical challenges, Saiga-based tourism is feasible and has already been piloted at various levels, although the involvement of local communities in these existing offers is limited to providing additional services to tourists. In Kazakhstan, the Association for the Conservation of Biodiversity of Kazakhstan (ACBK) conducts regular wildlife watching tours to protected areas in the vicinity of the capital Astana, where it is also possible to observe Saiga, although the main attraction of most of these tours is birdwatching. The focus is directed to Saiga during a steppe tour, which takes several days of travelling through central Kazakhstan. The participants get to see the beauty of natural grasslands and their wildlife and get the chance to see a Saiga aggregation at the time of calving with a lot of animals in the surrounding of this aggregation (requiring permission from the wildlife authorities). Most tourists reported that Saiga has been the outstanding highlight of the tour. However, ACBK has found it difficult to get sufficient participants for this kind of tours, probably due to the relatively long time spent driving and the higher price of the tour.

The “Stepnoy zakaznik” in the Astrakhan region of Russia has offered tourism and school visits for several years to a hide set up at one of their two artificial artesian lakes. There is a good opportunity to view Saigas and other species visiting the water holes, and there is also a small

guesthouse within the protected area. The reserve “Cherniye Zemli” in Russia offers day tours as well as overnight stays in yurts or caravans. Watching points allow a rather good view of Saiga. The reserve has reported increasing numbers of visiting tourists in recent years (Zapovednik Cherniye Zemli, 2022).

These examples show that careful planning and investments in touristic infrastructure are needed to make Saiga watching more attractive for tourists. The feasibility of Saiga-based tourism differs depending on the Saiga population, as it requires different levels of efforts to overcome the above-mentioned challenges. For instance, if the Saiga population is closer to roads or railways, it is easier to access and therefore more suitable for tourism.

The Pre-Caspian Saiga population in Russia offers rather good conditions for tourism, as it is comparatively easy to access and offers some touristic infrastructure at least inside protected areas. The growing Saiga population makes it attractive to visit the area as there is a greater chance to be able to observe many animals.

None of the existing tourist offers described above are organized by local communities. General challenges for organizing community-based tourism related to the current legislation are described in Section 3.4.2. Local people currently do not benefit much from increasing interest in Saiga, other than those providing accommodation or other related services and goods to tourists. In the next paragraphs we provide a general estimate of the potential of Saiga populations in Kazakhstan, Mongolia and Uzbekistan to become an object of community-based tourism development. If there is interest to develop these ideas, an in-depth feasibility study should be conducted, including an assessment of the legal obstacles and possible solutions, interest of local people to become involved, provision of technical support for local business development, estimate of required investment in the development of infrastructure, services and marketing.

Of all the three populations in Kazakhstan, the Ural population has the best conditions for the development of community-based tourism. The largest Saiga herds are located relatively close to an airport and train station (Uralsk city) and are accessible on rather good roads most of the distance. Furthermore, the Ural population is of a large size and is restricted to a rather well-defined area, which makes it easy to plan for Saiga observations. Touristic infrastructure is currently lacking, but its future development may be considered in the context of the newly designated Bokey-Orda reserve in Western Kazakhstan. The reserve has the potential to attract more people to visit the area. Here again, it is important to involve local communities in developing these tourism opportunities and to give them the chance to benefit from touristic business, thereby helping to alleviate the human-wildlife conflict related to competition for pasture and crop raiding by Saiga (see Section 2.2.1).

The Betpak-Dala Saiga population is also suitable for Saiga watching in its Tengiz group, which occurs in Akmola and Karaganda regions not far from the capital Astana. This group can be visited rather easily and is sufficiently large to plan for Saiga observations. There is some touristic infrastructure at the Korgalzhyn reserve also run by local people, but this is more aimed at tourists coming from Astana for birdwatching in and around the reserve. The main Saiga habitats are further away, so further investments are required to develop touristic offers for Saiga watching. Although the Torgai Saiga group in the west of the Betpak-Dala range is much larger and living in more beautiful landscapes, it is difficult to access and almost devoid of any touristic infrastructure. But still, it is worth assessing the interest of local people, initiate the preparation

of a feasibility study and do some participatory planning of tourism offers, which can provide additional sources of income for local people, but also require quite some efforts and finances.

The Ustyurt population of Saiga in Kazakhstan has currently a limited potential for touristic use, as it is very remote and still rather small in size, although thanks to the ongoing recovery herds of more than 10,000 Saigas can again be observed. However, the landscapes of the Ustyurt are probably the most outstanding of all Saiga population ranges and have therefore the potential to attract visitors to the area. But the harsh weather and road conditions coupled with lacking touristic infrastructure are challenging. As local people live quite far from Saiga, the development of community-based touristic infrastructure and respective offers for this population seems currently rather difficult. The development of community-based Saiga conservation and the assignment of a wildlife management area to a local association (see Section 3.4.5) may improve this situation. This can trigger the establishment of some basic infrastructure for tourism, capacity building, and may allow for direct involvement of local people in tourism activities.

In Mongolia, no special touristic offers related to Saiga exist, although there is a lot of nature tourism existing in the country, which also involves local people. The Saiga population is still too small to be an attractive destination for tourism. And it lives rather far from the capital, requiring some travel inside the country for foreign visitors. However, if conservation efforts will eventually lead to higher Saiga numbers, there may be a higher potential for Saiga watching also in Mongolia.

In Uzbekistan, there is increasing interest and investment in tourism to the Aral Sea region, which can be linked to archaeological sites, the art gallery in Nukus, and Soviet-era sites like the stranded boats at Muynak. Major investment by the government, supported by conservation organisations such as the Saiga Conservation Alliance, could create some potential for the development of community-based tourism. However, the Saiga population is very sparse in the region and the main Saiga areas (Saigachiy reserve, Resurrection Island and the dry seabed of the Aral Sea) are in remote locations, near the international border, making it difficult for tourists to visit.

Currently, few touristic offers with the possibility to see Saigas exist with little involvement of local communities. The relatively high costs of travelling to Saiga ranges and lacking touristic infrastructure are substantial obstacles for Saiga-based tourism development. The Ural, Pre-Caspian and the eastern part of the Betpak-Dala Saiga populations are more suitable for attracting tourists than others due to the predictability of encountering the animals, population size and ease of access for people. However, more research into feasibility of tourism, ways of involving local communities, as well as investments in touristic infrastructure, capacity building for local businesses and marketing are needed to promote Saiga based tourism.

4.1.2 Extractive use

Extractive use of Saiga is currently only possible in Kazakhstan, where the species is not red-listed and the current Saiga population size allows for sustainable use for the benefit of local people and conservation following the principles listed in Section 3.1. We therefore explore options for CBWM with extractive use of Saiga in this country. Lessons learnt can be transferred to other Range States later, if desired.

Saiga and indigenous people of Kazakhstan have lived close to each other for centuries, whereby the species was valued for subsistence besides a spiritual and a cultural value (see Section 1.1.1). Saiga with its naturally high reproduction rate has a high potential for extractive use while at the same time historically unsustainable hunting and poaching have caused population collapses

bringing Saiga close to extinction at the beginning of the 20th and the 21st centuries (see Sections 1.1.2 and 1.1.3).

Saiga is listed on Appendix II of CMS, which allows for sustainable use considerations, while international trade in Saiga is regulated by CITES. The CMS Saiga MoU is the only international agreement dedicated solely to the conservation and management of Saiga. The Medium-Term International Work Programme (MTIWP) under the MOU has the long-term vision to "restore Saiga populations to the point that sustainable use can again be envisioned". Guidance materials prepared by CMS, such as the report "The sustainable use of Saiga Antelopes: Perspectives and Prospects" (Milner-Gulland et al., 2020) assessed the feasibility of non-extractive, but also extractive use of Saiga and concluded that harvesting Saiga was already feasible in 2020, primarily in the largest populations in Kazakhstan, Ural and Betpak-Dala. The Strategy for the Conservation and Management of Saiga in Kazakhstan adopted in 2023 outlines steps towards a sustainable use of Saiga in Kazakhstan. Importantly, both documents describe pre-conditions which need to be fulfilled to ensure sustainability of use. The Strategy in particular, developed by national stakeholders and international experts in Kazakhstan contains nationally agreed measures for involving local people in Saiga management that would enable implementation of CBWM.

The shift from pure species conservation to extractive use is likely associated with challenges in communication to the general public. Until now Saiga has been portrayed as an endangered species in need of protection, which is still widely accepted in Kazakhstan and beyond. Historically Saiga was valued by local people for subsistence and also had and still has a symbolic and cultural value. The recent shift towards treating it as species requiring regulation of population size – similar to wolves or jackals – led to protests in the general public (Tengrinews, 2022; Informburo, 2022). The culling to control Saiga numbers may affect the overall reputation of the species and its acceptance by local people. It also contradicts the traditionally positive image of the species. Therefore, a careful approach is required for initiating extractive use, highlighting the value and importance of Saiga. Referring to the historical importance of Saiga should be considered when developing communication materials.

As described in Section 3.1 on the theory of community-based wildlife management, involving local communities can achieve lasting conservation benefits. Considering the existing human-wildlife conflict with respect to Saiga, as described in Section 2.2.1, involving local communities in Saiga management needs to achieve two immediate effects: a sense of ownership for Saiga among local people and tangible benefits, which compensate the costs of coexistence with Saiga (both real and perceived) and of its protection from poaching. These immediate effects are needed to achieve the objective of maintaining, increasing and – where already deteriorating – recovering the positive attitude of local people towards Saiga and their readiness to coexist with the animals, to accept their impact on land use and to actively support law enforcement.

Developing a sense of ownership is necessary because local people still see the state institutions as the sole owners of Saiga and in charge of their conservation and management due to the Soviet legacy (see also Section 1.1.3 for history). First, authority over managing Saiga in defined wildlife management areas needs to be given to locally rooted entities. In the Central Asian context, these can be NGOs or local businesses (see Section 3.4.2 for a detailed description of this approach). In addition, recognition of own responsibility and authority is essential for local people to become active in Saiga protection and ensure sustainability of extractive use.

Ownership attitudes are difficult to develop and maintain without at least a perspective of material benefits. While equitable benefit sharing needs to be established, benefit sharing alone without ownership and resulting rights and obligations bears the risk of developing an indifferent attitude of recipients without assuming responsibility. These considerations reflect the principles

of sustainable and community-based wildlife management explained in Section 3.1 and in the examples presented in Section 3.3. The situations explained in section 3.3.1 on American Crocodile and in 3.3.3 on Vicuña are of particular relevance, highlighting the importance of material benefits as incentives for conservation, but also the role of active involvement of local people in the management of the target species.

Consequently, there should be two elements of involving local communities in a system of sustainable Saiga use:

1) local communities participate in the management of Saiga populations, which would create a sense of ownership;

2) they receive a share of the benefits from extractive Saiga use, either through directly hunting Saiga themselves or through receiving a portion of the revenues gained from commercial, large-scale hunting.

Depending on the setup of the system of sustainable Saiga use and particularly the entities having the right to hunt Saiga (see Milner-Gulland et al., 2020, for details on potential Saiga users), these two elements are addressed at different levels. The following solutions for the involvement of local communities seem feasible, not all providing both elements of involvement, meaning that likely a combination of several ones is required.

1. Representation in a management council

Local communities can be part of a Saiga management mechanism and participate in management decisions. This can be achieved by setting up a Saiga management council for each population, which would decide about hunting quotas, monitoring activities, conservation actions, and try to address problems like poaching cases, habitat fragmentation, disease outbreaks and conflicts between people and Saiga. An involvement in discussions about national CITES policies would also be beneficial. The example of wildlife co-management in Nunavut, Canada, with a Nunavut Wildlife Management Board deciding the management of reindeer provided by Milner-Gulland and colleagues (2020) can serve as a model for setting up such management councils. Members of such a council should include scientists, representatives of the wildlife authorities, ranger service, an agency responsible for managing and selling Saiga products (currently such responsibilities have not been assigned), nature conservation NGOs, hunting area managers, and representatives of local communities. Due to the various stakeholders represented in such councils, their decisions have the potential to be widely respected in society.

On the other hand, there is a risk that such councils due to conflicting interests and perspectives of the involved stakeholders do not reach consensus on key issues and majority decisions are not accepted or do not represent the best solutions for Saiga conservation and/or local land users. Scientific evidence might furthermore be neglected in decision making. Professional facilitation would therefore be helpful to ensure that any decisions benefit a peaceful coexistence of Saiga and people and take all available evidence into account. The establishment of such management councils is independent of the actual structure of the sustainable use system and institutions responsible for hunting. Its implementation is feasible and highly recommended due to the benefits associated with such councils, mainly the creation of ownership among involved stakeholders (particularly local representatives) and the direct consideration of local communities' interests leading to a higher level of local acceptance of management decisions.

2. Management of hunting areas (for domestic and subsistence hunting, hunting tourism)

Communities in the Saiga range could get a hunting area assigned for a certain period (10 and more years under the current legislation), which would transfer the responsibility for wildlife management at the specific area to them (see Section 3.4.2). This includes the right to hunt wildlife, allowing them to buy permits from the state and use them for themselves or sell them to hunters coming to hunt Saiga. These hunters can be from Kazakhstan, but also from abroad. The latter would allow to develop a business around Saiga hunting tours, which is likely to bring more revenues for the community than just shooting Saiga for subsistence. Therefore, this option might be attractive for some communities which have the capacity to deal with organized hunting. On the other hand, communities responsible for managing a hunting area would also be obliged to do anti-poaching work, which requires quite some investments according to the current laws in Kazakhstan, significantly limiting the profit earned from Saiga hunting tours. They can also be held liable if poaching occurs within the hunting area, as the case with ACBK in Central Kazakhstan has shown (Section 3.4.5). This option may become more attractive to non-commercial hunting area managers if legal changes would limit the liability of managing entities for poaching cases in areas, where proper protection measures are in place.

The general approach of enabling interested communities to become engaged in Saiga management by taking over the responsibility for wildlife management areas does not require any legal changes, as it is possible already now. The only requirement is to establish an NGO (CBO) or any other local, legal entity, which can act as a hunting organization, and it needs to have the right to buy hunting permits from the wildlife authorities. Furthermore, it is worth evaluating the example of community conservancies in Namibia and replicating those aspects of this successful model, which could be applied in the Central Asian context. For instance, the combination of rights for wildlife and land use, the lease of concessions for hunting and tourism on community land, the general combination of extractive use with well-developed tourism, and raising the prestige of being a wildlife ranger might be considered (section 3.3.2). If communities decide to trial this approach, they will likely need investment and assistance in terms of business planning and marketing.

It is advisable to develop a business plan before getting a hunting area assigned in order to assess if it is economically viable for the community. For instance, starting trophy hunting can be a profitable source of income. Export of sport hunting trophies is not considered commercial trade under CITES and thus currently possible with an export permit. Only very small numbers of Saiga males would be hunted annually, due to the very limited market for these hunts. An annual quota of a few tens of animals would already be difficult to market. Such small numbers could be even harvested in small Saiga populations. Even in populations, which are not allowed to be hunted yet, the perspective of future Saiga use by communities could motivate local people to conserve Saiga and their habitats. The example of the American crocodile from Colombia has shown that local people were motivated by prospects of future use to set up effective conservation measures which restored the population and its habitat (Section 3.3.1).

There are two issues with this option of community involvement: First, the range areas even of local Saiga groups, not to mention whole populations, are too vast to be covered by a wildlife management area with an NGO based on a single community. Therefore, associations of such community-based groups would be needed, to which the wildlife management area would be assigned. This approach is currently piloted in parts of the Ustyurt population range. Another opportunity might be the creation of networks of wildlife management area holders across defined parts of a Saiga population range, similar to the Red Deer Management Associations

(Hegegemeinschaften) in Germany, where membership would be mandatory for all hunting area holders in the respective region.

The second problem is that not all communities at a certain Saiga population range would equally benefit from managing a hunting area. Only the holders of hunting areas, where Saiga occur during the hunting season in autumn, would actually be able to hunt them. However, there might be communities close to calving grounds, where Saiga aggregate in large numbers and compete intensively with livestock and other land uses, consequently causing high costs, but where Saigas are completely absent during the hunting season. In contrast, there might be areas where Saiga are present during the hunting season, but the impact on land use is small. This unequal spatial distribution of costs of living with Saiga and of potential benefits would likely cause tensions among communities in the Saiga range. An efficient and just benefit sharing mechanism is needed to avoid this. It is therefore worth considering the establishment of associations or networks of communities across each Saiga population range with transparent, internal mechanisms of benefit and cost sharing.

3. Hunting permits for sport and subsistence hunting by domestic hunters

In order to raise the interest of individual domestic hunters in Saiga conservation, a limited number of hunting permits for local hunters could be issued. No commercial trade in Saiga products from this type of use should be permitted. Primarily hunting permits for local hunters could be sold to the entities in charge of wildlife management areas in the Saiga range. A state authority could also give them for free to local communities to allow local hunters to hunt Saiga for subsistence. However, such permits would likely raise legal problems and conflicts with the wildlife manager and therefore would probably not be used inside wildlife management areas, but outside.

While both ways seem to be an easy solution, two main issues need to be taken into consideration: The legislation in Kazakhstan does not currently foresee providing hunting permits to local communities, but only to hunting area managers, which can sell them to any hunter wishing to use them. Furthermore, control mechanisms need to exist in order to avoid misuse of these permits. Such control mechanisms do not currently exist outside of hunting areas. Involving hunting area managers would solve these issues. Entities in charge of wildlife management areas could be obliged to provide some free (or cheap) permits to certain communities, where Saiga occurs during the hunting season. This is easily realized within current legislation. The lawful use of these local hunting permits would be controlled by hunting area rangers.

4. Subsidized meat for local communities

Although people in the steppe are traditionally familiar with hunting, it might be an easier and economically more viable choice to let professional hunters shoot the animals and share the meat with local people. This would also be preferable from a wildlife management and animal welfare perspective. This option would be possible, if the hunting would be of large scale and state controlled, organized by a national level entity like Okhotzooprom, which would also ensure enforcement of hunting quotas and rules. No significant legal adjustments are required to allow for sharing meat apart from bylaws on veterinary regulations. People living in the Saiga range would probably readily accept food at self-cost or possibly even subsidized price, letting them save some of their own livestock, which they would have slaughtered otherwise. Saiga meat has traditionally been valued in its range. Its availability at affordable prices therefore has the potential to create a positive attitude towards Saiga conservation and the Saiga use system,

mitigating conflicts between Saiga and people. However, as local people will not be hunting themselves, some of them may engage in poaching Saiga despite the existing supply of meat. Sharing meat from Saiga hunts in this way is not sufficient to develop a feeling of ownership among community members for Saiga. This missing ownership may lead to a lack of peer pressure and control between community members, which normally restrict poaching by local people. Therefore, there is a risk that poaching by local people could even increase. This risk can be reduced by the simultaneous development of the above-mentioned community involvement in Saiga management to create and maintain ownership. Before implementation, a thorough analysis of local people's attitudes towards this idea should be conducted to be able to assess its likelihood of contributing to Saiga conservation objectives.

5. Shared revenues from commercial Saiga harvest and legal trade

As an alternative or addition to providing Saiga meat to local communities, they could also have the chance to receive a certain percentage of the revenues from the sale of Saiga products nationally and probably in the future also internationally. This can be achieved by directly distributing a certain percentage of the total revenues to all communities in a certain Saiga range, with every community receiving a share of this money proportionally to their size or the recorded Saiga density on pastures or fields, which they can use for the benefit of the community. Additionally, the share for local people could grow with increasing presence and impacts of Saiga on communal land, thereby rewarding farmers and livestock keepers, who carry a particular burden of coexistence with Saigas. If local people would get a reward payment for living with Saiga, Saiga satellite tracking data and observations by wildlife rangers could become the basis for assessing the presence of the animals on community lands and later for distribution of funds among communities.

If paying compensations for the impact of Saigas on land use is preferred, the development of an unbiased and transparent assessment mechanism would be needed, as already existing for other species in other countries (for instance, damage caused by wild boar in Germany, Landwirtschaftskammer Rheinland-Pflalz, 2015). The development of such a methodology seems rather challenging, takes more time and is associated with some risk of distrust and conflict both among communities in a Saiga range and among members of a community.

Instead of distributing funds directly to communities, the share for local people could be collected in a fund, to which communities from the Saiga range can apply to finance local development projects. A similar model exists in Namibia with the Game Products Trust Fund (Conservation Namibia, 2024), of which many elements can be used for Saiga products, too. The money would be distributed across all communities in the Saiga range, granting an amount, which would – averaged over several years – be approximately proportional to the presence of Saiga on the land used by community members. This would show people the benefit from lots of Saiga around them and likely mitigate conflicts, creating support for Saiga conservation. The latter mechanism seems to be preferable as it offers less room for corruption and misuse, as the money is linked to a defined purpose. The eligibility of communities for payments from this fund should preferably also be linked to the absence of poaching. The money can also be used to compensate for damage caused by the presence of Saiga. Alternatively, such funds for compensation could be managed separately.

6. Collection of horn

Collecting the horns of Saiga males, which died naturally, although not requiring the take of live animals, is nevertheless considered as extractive use in national legislation and is prohibited, while international trade in these horns would fall under CITES regulations. These animal parts can potentially be used for the benefit of local people. Local people, community-based NGOs, entities managing wildlife management areas have a great chance of finding horns from natural Saiga mortality. To allow legal horn collection changes to the legislation are needed.

If these changes were adopted, collected horns should be immediately delivered to collection points of an appointed national state institution, managing Saiga horn stockpiles or being responsible for Saiga protection and/or hunting. The horns should enter the national stockpile management system, including marking, registering and further transport to a storage. No individual financial reward should be paid to the collector to avoid the creation of adverse incentives for poaching under the pretext of natural mortality. Revenues from collecting horns from natural mortality should be allocated through a national fund to the contributing communities to finance activities and investments benefiting the community as a whole. A substantial number of horns can be collected in the area of rut aggregations, as male mortality is naturally high after the rut.

The delivery of collected horns to official state institutions bears the risk of misuse, as also poached horn could be delivered. Therefore, the horns should be carefully examined to identify them as not coming from freshly killed animals and geographic coordinates and photographs of the collection site providing indications on the cause of death should accompany the collected horn as evidence of natural mortality.

Deciding about the mode of involving local people

The decision on the modality of involving local communities, possibly combining several of the six options described above should be made during the planning process of a system of sustainable Saiga use. All the options are feasible given current legislation but bear considerable risks in terms of failing to ensure equitable benefit sharing.

A combination of these options has the best potential to generate incentives for local people to support Saiga conservation and to tolerate Saiga on their lands. It is highly recommended that at least one of the first two options of involving local people is included: 1) the participation in a management council and 2) managing a wildlife management area. Both these options aim to enable direct participation of local communities in Saiga management, while the latter also generates economic benefits. These options should be combined with any of the options 3 to 6, preferably several of them, which should generate (more) economic benefits for local people.

Before commencing implementation, similar approaches from around the world need to be thoroughly studied. The ecological and social baseline situation at the different Saiga ranges should furthermore be carefully assessed to evaluate the risks of any management options as well as likely perception of these options by local people. Based on the outcomes, selected involvement options should be piloted, properly monitored and adapted as needed before being rolled out on a larger scale.

A challenge valid for several of these local community involvement options is the vast range of most Saiga populations and the large number of communities and wildlife management areas falling into that range. While a population's range is typically covered by several wildlife management areas, a wildlife management area is rarely on the land of just one administrative community. Therefore, Saiga population management will likely be linked to several

communities, which can form a kind of management board. In order to guarantee a just distribution of hunting permits and revenues (both meat and money) from Saiga use, the creation of associations of communities and/or wildlife management areas should be considered. The distribution of benefits could then be achieved by, for instance, using the community size and/or observed Saiga density as an indicator for impact on land use.

The conservation impact of most of the discussed options depends on monetary revenues from selling Saiga products. The coexistence of Saiga with other land uses is costly, and for being competitive in the sense of the cost-benefit scheme provided in Figure 18, the maximisation of income generation, especially cash income, would be desirable. Particularly the costs for law enforcement, protected areas and monitoring covered by the state budget are high. On top there are costs for management activities by holders of wildlife management areas, community-based groups and economic losses by land users caused by Saiga.

It is likely that none of the following activities will be able to offset the cost of co-existence with Saiga: non-extractive (nature tourism), extractive use like sport and subsistence hunting, hunting tourism, sharing of meat at affordable prices with local people and domestic commercial trade in meat. Nature tourism and hunting tourism have a rather limited market potential (see 4.1.1 and above in 4.1.2). Domestic sport and subsistence hunting and distribution of cheap meat do not generate substantial revenues and would hardly cover their own operational costs. The commercial market for Saiga meat is still difficult to predict and interviews with various stakeholders showed a varying assessment of Saiga meat ranging from low-quality to particularly high culinary and nutrition qualities (interviews in the Saiga range and in cities by S. Michel 2015-2023). Even in the latter case of demand at comparably high prices, production costs would also be high given the need for highly qualified hunting and processing brigades with suitable machinery to harvest and process high numbers of Saigas within a short period and in accordance with high standards of animal welfare, food quality and hygiene.

In contrast, the income generated from sustainable harvest of Saiga horn and international trade has the potential to generate sufficiently high revenues to cover the costs of necessary investment in the system of sustainable use, including the compensation of the costs of living with Saiga, and Saiga conservation and monitoring. Well-managed and strictly controlled international trade in Saiga products including horns can be a strong incentive to conserve Saiga and their habitats. This trade would increase monetary benefits and thereby significantly contribute to making Saiga conservation and its sustainable use economically viable. It would help to counteract the perception of Saiga as vermin. This perception is currently on the rise due to increasing competition for pasture between Saiga and livestock. It would furthermore reduce the intensity of calls for regulation of its population. Moreover, if international trade was legalized, it would decrease the demand for illegal Saiga horn, which is the main trigger for poaching.

Strictly controlled international trade would establish similar incentives as described in Section 3.3.3 for Vicuña. Applying an approach already used for tagging skins of CITES listed crocodilian species as described in Section 3.3.1 for American Crocodile could effectively prevent the laundering of poached and illegally traded Saiga horns. Each horn or pair of horns could immediately after harvest or collection from natural mortality be tagged with individual unique number and barcode, stored in a central data base. All collection, storage and trade in Saiga horn would be managed through a central organization. However, for the ban in international trade under CITES to be lifted several preconditions have to be met first, as Milner-Gulland and colleagues (2020) have explained. If one Range State would open international trade, the

conservation of Saiga populations in other Range States could benefit since illegal trade in Saiga horn as the main trigger for poaching would become less attractive.

Considering the recent development of Saiga populations in Kazakhstan a sustainable use of the species seems possible. In order to achieve a maximum of sustainability, a stronger involvement of local people living next to Saiga is necessary for both non-extractive and extractive use. The development of wildlife-based tourism by local communities can be enabled by legal changes and through financial and technical support for developing wildlife tourism offers. Options for direct involvement in management decisions include creation of Saiga management councils and assignment of hunting areas to local community-based NGOs. Additionally, the right to hunt Saiga for own use as well as sharing benefits from large-scale commercial Saiga use can generate direct benefits. All these options aim to create a sense of ownership among people in Kazakhstan for Saiga, which has been lost due to the centralized management system prevailing in the region (see Sections 1.1.3 and 3.2.4). Empowerment of local communities to directly contribute to and benefit from Saiga management will generate support for Saiga conservation and management measures, alleviating human-wildlife conflict by improving the tolerance of Saiga presence among local people (see recommendations in Section 5.1.2).

4.2 Argali

Major threats for Argali are poaching, associated disturbance, competition with livestock and habitat degradation caused mainly by overgrazing by domestic animals (see Sections 2.2.2 and 2.3.2). Community-based wildlife management has shown potential to address these threats effectively as in the example of mountain ungulate populations managed by community-based NGOs and small family enterprises in Tajikistan (see Section 3.4.3). Here we discuss the specific potentials of non-extractive and extractive use as incentives for the conservation of Argali and its habitats.

4.2.1 Non-extractive use

The potential to integrate Argali observations into nature tourism is rather limited if thinking about the species alone. Although offers to see mountain ungulates in the wild can be an attraction for some tourists, offers including other species e.g., large carnivores can easily outcompete these. Argali are rather an additional asset of attractive landscapes than an object for which considerable numbers of tourists would specifically visit a certain destination. If effective protection from poaching and minimal disturbance are ensured, wildlife can become less wary of human presence and easier to photograph. Such good photo opportunities would raise the interest of tourists to come. The attractivity of such tours can be further increased where there is an opportunity to experience pristine mountain ecosystems, to observe other wildlife in addition to Argali and to visit cultural sites. Best chances to develop successful touristic offers may be in places, where a combination of these different opportunities exists.

Considering the currently relatively low numbers of tourists specifically interested in wildlife watching in Central Asia, Argali and other mountain wildlife watching in Central Asia is a niche-product in the tourism market and has only marginal potential of contributing to a wildlife-based business sector. Currently, Argali watching is an economically interesting option particularly where picturesque and healthy mountain ecosystems and possibly cultural offers exist, which attract tourists and support the development and maintenance of related infrastructure and

services. At such sites Argali observations can be offered as an additional highlight or for people with specific interest in the species. However, even the highest priced photo trips for Argali provide revenues much below those, which can potentially be gained by hunting tourism with typically lower effort. Therefore, it is advisable to explore the option of combining the non-extractive and extractive approaches. For example, wildlife watching can be developed successfully where no hunting is allowed, only a few hunts take place or outside of the hunting season. However, a major challenge related to the current legislation as described in Section 3.4.2 is that entities, which manage a wildlife area, have to bear the costs of wildlife protection and other measures, while at the same time have no exclusive right of touristic use of the area. This means that other entities or individual tourists can also use the area without paying the managing entity for this use.

4.2.2 Extractive use

Argali is a species which is highly attractive for hunting tourism. Prices paid per hunt can reach 60,000 USD or more, particularly when marketed or auctioned as hunts for conservation. At the same time, the direct negative impact on the Argali population and its habitat from this activity is minimal. The Argali has a polygynous mating system, in which the largest rams normally have the highest reproductive success. In such systems the offtake of few males of the oldest age class has no impact on reproductive success and no genetic consequences, if quotas are set conservatively (Festa-Bianchet, 2016). On the contrary, an example of hunting having impacts on a wild population is provided by the often-quoted paper by Coltmann and colleagues (2003), describing a very specific situation of an intensively hunted population of bighorn sheep *Ovis canadensis*. In that specific case the harvest of a large share of all rams reaching a certain horn length, although long before full maturity, caused a selective pressure against rams with fast and large growing horns. But the findings of this paper are not applicable for the situation of Argali trophy hunting, which targets only a very small proportion of the males reaching maturity (typically 8 years and older) and allows males to pass their genes and be subject to (horn) size-related selective pressure. Under the condition of a conservative quota, e.g., less than 1% of the recorded population size and up to 20% of the rams of 8 years and older, even the occasional hunt of a younger male does not cause damage to the population.

Some Argali are migratory between seasonal habitats and may gather in larger herds during winter. Often some continuity of preferred sites can be observed if habitat conditions are suitable and persecution and disturbance minimal. This allows for the area-based management of Argali, i.e. the maintenance of favorable conditions can ensure hunting success in the long run.

Argali could theoretically be used for other forms of hunting, i.e. local subsistence and sport hunting. Such hunting generates lower revenues per animal taken and typically larger numbers are harvested. Therefore, the impact on population size, behavior and use of habitats would be much larger than in the case of hunting tourism. Currently such hunting is not legally practiced anywhere in the range of Argali. It might be considered under very specific circumstances. Under the condition of a full large-scale recovery of an Argali population and a limited market for hunting tourism, such hunting might become an option. However, even where populations are currently close to or beyond carrying capacity dispersal to other areas with suitable habitat should be facilitated rather than a population reduction via hunting.

Most of the Argali range in Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan is either assigned to commercial hunting concessions or belongs to protected areas. In Kazakhstan, Argali is protected as a Red Book species and no hunting permits are issued, except for scientific purposes.

In other areas, Argali are either extinct, occur only occasionally or numbers are extremely low. In Kyrgyzstan, Argali currently occurs irregularly in one game management area assigned to a community-based NGO in the Alai valley. In Tajikistan, community-based NGOs have difficulties to receive hunting quotas for Argali due to the influence of commercial concessionaires, preventing others from access to such permits (see Section 3.4.3).

In Mongolia, Argali hunting is possible only in designated hunting areas which may overlap with local-level protected areas but not with national-level protected areas. The extent of Argali habitat in Mongolia currently neither designated as a hunting area nor as a national-level protected area is not known, but likely small. In Mongolia, the management of Argali hunting is not transparent. At least 50% of the hunting fee (24,000 USD for one Altai Argali ram and 12,000 USD for one Gobi Argali) is required by law to be spent on argali sheep protection. However, this provision is generally not implemented. An additional shortcoming seems to be that the revenues for local development projects or social costs are limited as the allocation to the local administration (Soum) is compensated for by respective cuts of financial aid from the national government. If a Soum plans a high hunting quota, which in the end is not fully used, these financial cuts still remain and can even cause net losses (Reading & Amgalanbaatar, 2016; Amgalanbaatar, pers. comm. 2022).

The Sections 3.4.3 and 3.4.4 describe several examples for CBWM in Tajikistan and Kyrgyzstan, which have already delivered some success for conservation of the species. These examples show the potential of community-based wildlife management for Argali conservation, particularly in areas used by people for livestock grazing and other activities. However, the situation in Tajikistan and Kyrgyzstan also demonstrates that Argali are highly attractive for stakeholders with a commercial interest and political influence due to the potentially high revenues from trophy hunting tourism. While areas with likely permanently low Argali densities due to competition with livestock seem to be of little interest for commercial use, some influential stakeholders mistakenly perceive the existence of the community-based approach in such areas even with small quotas and its provision of direct tangible benefits for the local communities as a threat for their business model.

Even if areas with substantial Argali numbers would remain under the control of commercial enterprises, allocating some areas for NGOs with a community-based approach can complement these concessions, especially in areas with lower potential for Argali and higher human presence. If planned accordingly, this would benefit the connectivity between populations, conservation of the species across larger parts of its range, involvement of traditional hunters, community involvement and finally the reputation of the country as a tourist destination and keeper of globally important biodiversity and environment. It is worth taking a closer look at the example of community conservancies in Namibia to identify elements, which could improve the opportunities for communities in Central Asia (Section 3.3.2).

Concluding, Argali provides good potential for CBWM as well as serious challenges. The species can be an attractive element of ecotourism assets and is extremely important for hunting tourism. Both can be compatible. Due to the high commercial value of Argali hunting, areas with good Argali populations are usually controlled by private businesses, which limits the opportunities of establishing CBWM in Argali range areas. However, CBWM could complement private management and protected areas in sites with currently limited potential for Argali hunting and thus help to expand the range and contribute to connectivity between subpopulations.

4.3 Snow Leopard

In the following sections we explore how local communities can become involved in the conservation and management of the Snow Leopard and receive benefits from having the species close to their homes. Non-extractive use in the context of community-based tourism is a potential option despite the difficulties caused by the cat's elusive behavior. Extractive use of Snow Leopards is not considered an option. We will therefore explain how Snow Leopards may benefit from an extractive use of its prey species.

4.3.1 Non-extractive use

The potential of applying CBWM to Snow Leopards is limited to approaches building on non-extractive or on indirect use and benefits. The combination of introducing nature tourism or conditional livelihood support and mitigating conflicts has been successful in some areas in Central Asia and beyond (Jamwal et al., 2018; Maheshwari & Sathyakumar, 2019). For instance, in the region of Kibber in Spiti, India, nature tourism specifically targeted at Snow Leopard observation has motivated local people to declare zones without livestock grazing for the benefit of the Snow Leopard's wild ungulate prey (Mishra et al., 2024). The market for specific wildlife-related nature tourism in Central Asia is very small – compared to destinations in Africa, the Americas or South/Southeast Asia – and the willingness to pay for wildlife observations and photography is currently insufficient to generate substantial incentives across the landscape.

The elusive behavior of the Snow Leopard favors the use of local guides for Snow Leopard observations, which may offer a good opportunity for community-based tourism. One way to develop such tourism offers is through setting up a community-based NGO, which can then become a managing entity of a wildlife management area (see Section 3.4.2). However, a particularly challenging obstacle for tourism development is the lack of legal authority for managing entities to exclusively market wildlife and nature tourism in their areas and to prevent unauthorized and unpaid visitation by third parties.

Examples from Tajikistan have shown that tours for Snow Leopard observations are possible even at high prices. Between 2018 and 2022, four groups with a total of 20 tourists came for this purpose. In one area, a group observed Snow Leopard, in another area, two groups saw Snow Leopards, and in a third area, one group was unsuccessful. The tours have been marketed at high prices so that 5,000 USD per tourist reached the community-based NGO or family enterprise. The market potential for such high-price tours is certainly limited, especially taking into account the wide distribution range of the Snow Leopard with competing destinations in several Range States. Only a few communities could benefit from such an approach. Furthermore, typical nature tourists spend up to about 10% of the overall tour costs locally for Snow Leopard observations, limiting the revenues for local people.

In order to make nature tourism attractive for local people, their economic losses caused by depredation of Snow Leopards on livestock need to be limited. Therefore, a combination of nature tourism with human-wildlife conflict mitigation measures, such as predator-proof corrals, protective herding techniques and livestock insurances as practiced, for instance, in India has the potential to create positive attitudes among local people towards the presence and conservation of Snow Leopards (Maheshwari & Sathyakumar, 2019). Such approaches should be more widely applied throughout the region.

Another, more indirect non-extractive use approach is practiced in Kyrgyzstan, where locally produced handicraft from communities in the Snow Leopard range area is widely marketed

through the “Snow Leopard Enterprises” under the condition that no poaching would be tolerated by the community (see Section 3.4.4). While this is reported to be a successful approach, there has been criticism that transaction costs are high and that the share of the revenues reaching local people is not satisfactory. Another, probably more relevant problem might be that such income generation may not actually reach the potential poachers. In this case poaching will not be addressed sufficiently by this measure. Furthermore, given the limited market for specific products from communities in or close to the Snow Leopard range the replication potential is rather low. The involvement of an international NGO, the Snow Leopard Trust, in this example shows that this approach works only with an international partner, taking over the marketing and sometimes international sales of the handicraft, which is not possible for the numerous communities in the species’ range. But it can be a useful approach for some communities, which live in important Snow Leopard habitats and are nevertheless relatively easily accessible for tourists.

In conclusion, Snow Leopard observation tourism can provide tangible benefits to local people only in a few and specific cases. More often the Snow Leopard can be used to highlight the overall ecological integrity and conservation importance of a landscape, where touristic and other related activities take place.

4.3.2 Extractive use

Direct extractive use of the Snow Leopard is legally not possible and is also not feasible for various biological and other reasons. However, as described in Section 2.2.3, extractive use of its prey species can create incentives to keep the population size of mountain ungulates at high levels and thus can have a positive effect on the conservation of Snow Leopards.

The reduced availability of wild ungulate prey species impacts Snow Leopards through shortage of nutrition, particularly during critical periods like the raising of offspring, and may contribute to higher depredation of livestock, leading to the retaliatory killing of Snow Leopards (Suryawanshi et al., 2021; Khanal et al., 2020). The conservation of Snow Leopards therefore benefits from the conservation of their prey species. CBWM focusing on the sustainable use of the Snow Leopard’s wild ungulate prey through hunting tourism has a high potential of contributing to Snow Leopard conservation as successful examples from Tajikistan and Kyrgyzstan, described in Sections 3.4.3 and 3.4.4, have shown (Michel & Rosen, 2024).

Figure 29: Herd of adult male Asiatic Ibex – the main prey species of Snow Leopard in Central Asia – in a community-based game management area. Tajikistan. Photo: ANCOT.

Hunting tourism creates strong incentives to prevent poaching and unsustainable hunting. This is because this type of hunting requires a sufficient number of old-aged male ungulates, which preferably should not be extremely wary to allow to be approached by the hunter with the assistance of local guides. To achieve this, the overall population should be large enough and the mortality should be low to allow enough males to reach old age. In populations which are subject to poaching these requirements are typically not met – numbers are low, older age classes are missing and animals are very wary and keep large distances from humans. Setting very conservative hunting quotas, as explained for Argali (see Section 4.2.2) is needed for ensuring hunters' success while avoiding selection against large males and preserving enough old animals as potential Snow Leopard prey. Wegge (1997) proposed quotas of 20-25% of the estimated number of trophy sized males, which is <4% of the total number before the hunting season. In Tajikistan, e.g. for Markhor, a quota neither exceeding 1% of the recorded population nor 20% of the number of males older than 8 years was applied (Michel & Rosen, 2024).

Potentially, sustainable hunting for food and sport by local people could also be an option if populations are large enough. However, this type of hunting would target different age classes, result in the harvest of more animals and have a higher impact on population size and – depending on the intensity and timing of hunting – on behavior and thus on prey availability for Snow Leopards. In the absence of foreign hunting tourism opportunities, this option may nevertheless deserve consideration. Domestic hunting may be of particular relevance for conservation, if it can achieve an improvement compared to unregulated take by poaching through providing opportunities for legal hunting and/or if it helps to prevent habitat degradation from excessive livestock grazing.

An important element of Snow Leopard conservation is a clear communication of the message that tolerance and conservation of predators are mandatory. In Pakistan (Hussain, 2003) and in Tajikistan (own observations by S. Michel) some stakeholders involved in community-based

conservation and sustainable use of ungulates perceived Snow Leopards as a threat to their conservation objectives as well as economic interests. In one case a manager of a family-based wildlife management area even brought a little herd of domestic goats to the mountains in the hope that they would be easier prey for the Snow Leopard than "his" wildlife (Markhor). Feeding wild predators with livestock is discouraged by conservation experts, because predators may become conditioned to take livestock as easy prey and domestic ungulates may transfer contagious diseases to their wild relatives (Ostrowski et al., 2012). However, there is no evidence of any persecution of Snow Leopards in this context. In Tajikistan, the stakeholders in community-based management of ungulates quickly understood that the Snow Leopard does not have adverse impacts on wild ungulate populations and that with good protection against poaching enough males reach old age making them attractive trophies despite some animals becoming prey of Snow Leopards. Indeed, many people see the Snow Leopard as an indicator of their conservation success and proudly share footage of encountered Snow Leopards.

An increase of wild prey numbers and, as a result, growing numbers of Snow Leopards can result in a higher frequency of attacks on livestock (Mishra et al., 2016). Preventive measures in form of, for instance, predator-proof corrals and adapted herding practices are therefore of high importance to prevent retaliatory killings. Livestock insurance schemes, preferably managed at a community level, as for instance in Pakistan, can also be necessary and support the acceptance of Snow Leopards by local communities (Kunkel et al., 2016).

Habitat conservation in the context of community-based conservation of Snow Leopards is more challenging than the prevention of illegal killings of Snow Leopards and their prey. The incentives generated by sustainable use of the Snow Leopard's prey species and by other economic benefits rarely reach a level leading to a substantial reduction of pressure caused by land use, particularly by livestock grazing. Some examples, as from Spiti (see above) and Ladakh (Mishra et al., 2024) as well as some areas in Tajikistan (pers. comm. by local stakeholders to S. Michel), show that the combination of tangible benefits from wildlife use and the creation of awareness about the sustainable use of pasture can motivate local people to establish permanent or temporary zones without or with limited grazing or to reduce other harmful practices like the collection of dwarf shrubs for fuel in certain areas.

There is evidence that after the establishment of CBWM in hunting areas in Tajikistan, population numbers of wild ungulates, such as Asiatic Ibex and Argali increased in these areas, as shown in Figure 25 and described in Section 3.4.3, for example. Furthermore, camera trapping yielded records of substantial numbers of individually recognized Snow Leopards present in these areas. A trend of increase was found in the repeatedly surveyed area of NGO Burgut in the Eastern Pamirs: spring 2013: none; summer 2014: at least 3; summer 2016: 5; and summer 2018: 9. Direct observations of Snow Leopards also increased, allowing to pilot wildlife-watching tourism focusing on Snow Leopard observations, as mentioned above.

In Kyrgyzstan, community-based wildlife management benefits the conservation of Snow Leopard in a similar way. In several areas, protected by community-based NGOs based on temporary agreements or assigned as wildlife management areas, local traditional hunters have contributed to a recovery of ungulate species by preventing poaching. Some of these ungulates are important prey of Snow Leopards. In the area of the NGO Janaydar, protected since 2015, the observations of Argali have increased tenfold in just 6 years and in a neighboring protected area, also used as a game reserve by another entity, the records of Argali have increased roughly fivefold in the same period (see Section 3.4.4 for details). Although there were no surveys covering all these areas, some evidence from camera traps also suggests an increase in Snow Leopard numbers following the increase of wild ungulates. Only one Snow Leopard was recorded

on a camera trap in this area in 2015, while in 2021 at a single site a camera trap captured photos of a female with two cubs.

Other species, which may benefit from reduced grazing and/or poaching pressure as a result of CBWM approaches, include Roe Deer, Maral, and Wild Boar, which are also occasional prey of Snow Leopards. This suggests further benefits of community-based management of wild ungulates for Snow Leopards.

However, there are challenges for implementing CBWM in hunting areas in Central Asia. Legal challenges are described in 3.4.2, and more political challenges are shown on the examples from Tajikistan (see Section 3.4.3). The closing of most community-based NGOs for wildlife management in Tajikistan by a Government decision, and the reassignment of a wildlife management area to a commercial enterprise, which already manages the best Argali area and hosts most clients, have likely severely damaged the potential of community-based conservation of Snow Leopards. These developments not only affected hunting tourism as the most important source of revenues for conservation and community development, but also massively hamper wildlife-watching tourism, which had been marketed and logistically supported by the now closed NGOs. New commercial holders of the areas prevent local stakeholders from being involved in tourism and wildlife monitoring activities. Poaching control without the support of local people is likely to be less effective. In addition, poaching for reasons like resentment or due to lacking control by local communities could again become more frequent. Coupled with potentially unsustainable hunting and only marginal investment in conservation due to the prevailing interest of new commercial area holders in short-term profit maximization may quickly reverse the positive trends in the population numbers of Snow Leopards achieved so far.

In conclusion, conservation of Snow Leopards through community-based initiatives is possible through wildlife watching tourism and hunting of Snow Leopard prey. The potential for Snow Leopard observations is limited in the target countries due to the rarity of the species, remote habitats and the cat's elusive behavior. But successful examples exist in the region and their replication should be explored in selected locations. CBWM, as applied to Snow Leopard ungulate prey, has a high potential to generate incentives to preserve Snow Leopard prey and habitat. CBWM of prey species has chances for success, wherever community members with interest in wildlife, typically traditional informal or formal hunters, can be empowered to manage wildlife, have the authority to prevent poaching by others and profit from this activity. Chances of success depend on the overall political and economic environment, good facilitation at the stage of establishing CBWM initiatives and on the individuals involved. Even in cases where no hunting is currently possible, a realistic perspective of sustainable use of the relevant Snow Leopard prey species can provide a strong incentive to actively protect wildlife even before first legal hunts become possible.

4.4 Bukhara Deer

In the following, we explore how local communities could become involved in the conservation and management of Bukhara Deer and receive benefits from the presence of the animals on the lands used by them. Developing touristic offers with Bukhara Deer observations has some potential especially coupled with other touristic offers. However, given the current sizes of Bukhara Deer populations in protected areas, as well as a high poaching pressure outside of protected areas, allowing extractive use should be considered as an incentive for tolerating the deer outside of protected areas and where necessary also for control of population size and reduction of conflict with land users.

Community-based approaches have not yet been applied for the conservation of the Bukhara Deer. The Technical Workshop under the CMS Bukhara Deer MoU in October 2020 adopted the Programme of Work for Bukhara Deer 2021-2026. It includes activities on maintenance and restoration of available habitat by optimizing relations with local communities and increasing acceptance by them. There is a set of activities aiming to involve local communities in Bukhara Deer conservation. These activities include alternative forms of income generation for local communities, enhancing sustainable natural resource use, ecotourism development with local community involvement, elaboration of compensation schemes and measures for minimizing damage to farmers as well as the exploration of the feasibility of deer farming for antler production. Due to the current protected status of Bukhara Deer in national legislation and its listing on Appendix I of CMS, no extractive use of free-ranging populations is considered in this Programme of Work.

The Bukhara Deer occurs in areas which have at least some agricultural land use in the surrounding, and therefore the involvement of local land users in its management would be beneficial to mitigate and prevent conflicts. Applying a CBWM approach can help to influence the attitudes of local people towards Bukhara Deer, which is currently being perceived as a vermin by local land users. In accordance with the principles described in sections 3.1-3.3, local communities could directly benefit from the presence of Bukhara Deer and at the same time develop a sense of ownership for these animals. Tolerance towards Bukhara Deer presence and related crop damage, support of its conservation and active involvement of local communities are more likely if not only damage to land users is reduced, but tangible benefits are derived from the Bukhara Deer presence. If only some people benefit from the Bukhara Deer, mechanisms to ensure a balanced benefit sharing with other land users, also experiencing agricultural losses due to Bukhara Deer might be needed.

As outlined in Section 2.3.4, one of the main threats to Bukhara Deer is habitat loss. In order to improve the conservation of Bukhara Deer CBWM can be applied to increase the motivation for the restoration and conservation of riparian forests and surrounding habitats, similarly to the example of mangrove restoration, achieved by local community members motivated by the prospect of using the American crocodile in Colombia (3.3.1). A part of the revenues from both non-extractive and extractive use could be directly used for habitat restoration. In addition, allowing hunting the animals under the condition that habitat restoration measures are undertaken could be a material incentive to conserve the animals and their habitats. The restoration measures could include setting aside some areas for the animals without agricultural use by those benefitting from the hunting.

4.4.1 Non-extractive use

The occurrence of Bukhara Deer almost exclusively in state-managed protected areas provides only limited options for community-based tourism development. The mostly hidden life of Bukhara Deer makes observation difficult. Similarities to European Red Deer and Wapiti or Maral in North America and Asia make it not exceptionally exotic or particularly attractive for tourists. However, Bukhara Deer is rather big and not wary in areas, where it is not illegally hunted. Some potential for improving the attractivity of Bukhara Deer as an object of wildlife watching with an appropriate marketing strategy exists.

The riparian woodland habitats of Bukhara Deer are also of some touristic interest and could be integrated as additional highlights in touristic tours in the Central Asian countries. Bukhara Deer habitat is also in proximity of spectacular cultural heritage objects, and diverse landscapes including deserts, steppe and mountains. The chance to see a rare species like Bukhara Deer in such landscapes has the potential to attract tourists, which has not been used much to date.

For instance, two recently established populations in the Ile-Balkhash Reserve and in Turkistan forestry in Syr Darya valley in Kazakhstan might become promising observation sites, the latter being relatively close to the cultural heritage of Turkestan city. Consequently, touristic use of Bukhara Deer and its habitats is feasible, but is likely to provide only limited revenues by itself. Therefore, it would require integration in larger touristic packages, including cultural sites and a good marketing strategy to make Bukhara Deer observations more popular. A particularly challenging obstacle for tourism for all of the focal species is the lack of legal authority for managing entities to market wildlife and nature tourism in their areas exclusively and to prevent unauthorized and unpaid visitation by third parties. This also applies to touristic offer development outside protected areas for Bukhara Deer.

As long as the Bukhara Deer mainly occurs inside protected areas or otherwise state-controlled areas without any possibility to involve local communities in their management, the establishment of CBWM approaches seems to have limited potential. However, habitat expansion beyond protected areas may lead to new opportunities, and it is already possible for local people to offer services for tourists, for instance, accommodation and sale of local products.

4.4.2 Extractive use

Currently strong legal limitations exist for the extractive use of Bukhara Deer. The species is listed in Appendix I of CMS, which does not allow taking, with very few exceptions limited in time and space (CMS Convention text, Article III). Accordingly, Bukhara Deer is legally protected in all Range States and no hunting permits are issued, with few exceptions in Uzbekistan. In addition to that, Bukhara Deer currently occurs mainly inside protected areas, where hunting is generally prohibited. However, there is one population in a partly high-fenced game management area in Kazakhstan with several dozens animals free-ranging in its surroundings. Growth of population in protected areas, reintroductions to new sites and natural dispersal may lead to a range expansion into areas, where sustainable hunting might become an option.

Maral velvet antlers are used in for medicinal purposes, mainly in Asian countries and the species is farmed for this purpose, for instance in the Altay of the Russian Federation. Gritsyna and colleagues (2019) suggested the development of Bukhara Deer farming for velvet antlers as an economically attractive option, which could even provide funding for conservation measures. For example, the funds could be used to develop measures of conflict resolution around the Baday-Tugay section of Lower Amu Darya Biosphere Reserve with its high Bukhara Deer population and

increasing damage caused to agriculture. However, this approach would not be suitable to address two key problems: the mismatch between increasing Bukhara Deer population size and insufficient available habitat without land use and the conflicts between land user interests and Bukhara Deer presence in cultivated areas.

Furthermore, keeping the Bukhara Deer under farm conditions has various problematic aspects and risks. Any captive keeping of animals bears risks of domestication effects, genetic drift and veterinary issues. These may also affect the free-ranging population, if the contact is not entirely prevented and farmed Bukhara Deer are accidentally or intentionally released from pens. The high density of Bukhara Deer in enclosures causes a heavy degradation of the vegetation, not resembling their natural habitat and requiring additional feeding with fodder crops. Habituated male deer can be very dangerous for humans, particularly during the rut. In Tajikistan, one habituated Bukhara Deer stag reportedly killed its keeper (pers. comm. to S. Michel by local stakeholder). Cases of such deadly accidents are known also elsewhere. All these risks of Bukhara Deer farming, which are difficult to control, outweigh potential benefits. Consequently, farming of this species does not seem to be a feasible option for further consideration or implementation.

Figure 30: Bukhara Deer enclosure in Zarafshon State Natural Park, Uzbekistan. Photo: Michel

Almost all populations of closely related Red Deer and Wapiti or Maral living in their natural habitat are sustainably used through various forms of hunting. Even, in many national parks in Europe Red Deer is hunted in certain zones (e.g. Berchtesgaden, Müritz, Schwarzwald, Harz in Germany) or the population is hunted during migrations beyond the boundaries of the national park (e.g. Swiss National Park in Switzerland, Bavarian Forest in Germany). Maral is hunted in Kazakhstan, Mongolia and the Russian Federation. Depending on the specific situation, the conditions of the population and management objectives these deer are used for: trophy hunting, the production of venison for own consumption or trade and for regulation of

population sizes. Examples of such uses exist across the range of red deer subspecies in Europe, in North America and in Asia (Milner et al., 2006, Olaussen and Mysterud, 2012). Different types of hunting have different implications for population management. Typically, hunting objectives are combined in varying proportions.

Pure trophy hunting for mature stags is not suitable for the reduction of population sizes. It can only be applied if continuous growth of the target population is a management objective. In fact, trophy hunting can provide a powerful economic incentive for achieving growth in depleted populations (see examples of trophy hunting in community-managed areas, Sections 3.3 and 3.4). However, such population growth can be in conflict with other land users' interests.

Hunting for venison would in particular target the young age classes and can limit population growth depending on the chosen hunting quota. If faster population reduction is desired, it requires the offtake of a substantial part of adult females. As Red Deer and related species are social animals with a dependence of juveniles on their mother until the next birth season, this approach requires particular care. During such hunts for effective population reduction, hunters must ensure that always the fawn is shot first and the female afterwards so that no orphaned fawns remain. This is because orphaned fawns would suffer from lack of social connection, resulting in poor physical development or death (Simon et al., 2021).

Any form of hunting of Bukhara Deer would require legal amendments. In general, it is advisable to conduct inclusive and public consultations to achieve broad acceptance of planned measures. At the international level, political decisions need to be prepared thoroughly by developing well-designed concepts for a sustainable use of Bukhara Deer, which would convince species conservationists. If hunting of Bukhara Deer is desired, it would be necessary to remove the species from Appendix I of CMS while retaining it on Appendix II.

As described in Section 2.2.4, main threats to Bukhara Deer include habitat degradation due to anthropogenic reasons and due to overpopulation of available habitat in protected areas (Cornelis et al., 2019). In addition, natural dispersal is limited by missing connectivity between habitat patches in some cases or low tolerance for deer presence and poaching outside of protected areas. From a biological and management perspective well-managed hunting of Bukhara Deer, e.g. in the context of CBWM, could be a suitable tool to address these threats. If extractive use of Bukhara Deer becomes possible, it should be organized in a way that empowers local communities to manage the animals and generates material benefits for them. This can contribute to a broader acceptance of the deer presence also in cultivated areas to which they disperse, reduce poaching, and thus facilitate range expansion. Measures to avoid or reduce the excessive negative impact of deer on riparian tugay ecosystems can also include extractive use of the species. The proposed translocation of surplus Bukhara Deer from locally too large populations supports the recovery of the species' range area but does not resolve the overstocking problem, as translocation will not stop population growth and in any case will involve only small numbers of animals. In case of successful reintroduction, the new population would reach the carrying capacity of the reintroduction site within a few years, too.

As explained above, different types of hunting depending on the management objectives can be considered and combined. Sport hunting for foreign and domestic hunters might be the most economically significant source of revenues and it would be feasible in comparably small populations without hampering their further growth. Hunting for venison can serve local needs and potentially also be marketed through specialized restaurants but it would require larger huntable populations to be sustainable. In case of the existence of market demand and attractive prices, the use of antlers from harvested free-ranging stags may provide additional income. The

economic costs and benefits would need to be assessed, taking into consideration also non-monetary benefits for involved hunters and for the entire society.

A community-based approach in areas with residential hunters among the land users would probably achieve the best acceptance and thus the best results. Suitable management units in terms of actual and potential habitat and interested people would need to be identified, the establishment of appropriate community-based managing entities facilitated, and management rights for Bukhara Deer assigned to them. Management of Bukhara Deer's impact on land use and possibly compensation mechanisms need to be integrated into this system. Because habitat of Bukhara Deer is currently heavily fragmented, it should be managed as metapopulations over larger areas, ensuring connectivity between subpopulations, where possible, through connected habitats and mitigation of migration barriers and, where needed, human-facilitated genetic exchange.

Concluding, the potential of Bukhara Deer for CBWM is currently limited as the species mainly occurs inside state-managed protected areas. Touristic use with observations of Bukhara Deer alone has a limited potential, but can be an additional asset in tourism packages, which include, for instance, also visits to cultural sites. Extractive use is currently legally not possible with some exceptions. After adoption of changes of the CMS-listing and national legislation, various forms of extractive use are possible and may support the mitigation of human-wildlife conflict and population control measures in overpopulated protected areas. CBWM of Bukhara Deer has the potential to address several threats to the species, such as habitat degradation and competition with other land uses. This approach can support a range expansion beyond protected areas and connectivity of subpopulations divided by cultivated areas.

5. Policy recommendations for national decision-makers

5.1. General recommendations to the countries covered by this study (Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan) for applying Community-based Wildlife Management

The application of CBWM to managing CAMI species and their habitats should receive more consideration by decision-makers. Experiences from around the world, including some from Central Asia, have demonstrated that this approach can strengthen anti-poaching measures and effectively reduce or alleviate human-wildlife conflict. CBWM can provide important incentives for local people to refrain from illegal and unsustainable take and support the conservation of wildlife habitats, as was explained on the examples of the four focal species Argali, Bukhara Deer, Saiga Antelope and Snow Leopard.

Economic benefits from applying CBWM

Conservation measures for large mammals should take into consideration economic aspects. The economic benefits from extractive use, such as hunting, or from non-extractive use, such as wildlife watching tourism, should as much as possible offset the costs of protecting and managing wildlife populations and also the costs caused by wildlife for land users. These costs may include losses due to competition for pasture, crop raiding, livestock depredation and the cost of adjusting land use to reduce harmful effects on wildlife and their habitats. Furthermore, as shown in this study, the benefits derived from sustainable wildlife use can be a source of investments into community development and local social programmes. To achieve this, policy interventions and subsidizing the development of CBWM approaches at the initial stage can be an option, for example, to support business planning, capacity building, marketing and investment in equipment and infrastructure where necessary. Experiences worldwide and in the region demonstrate that CBWM approaches, if properly applied, for instance, by community-based NGOs and family businesses, are often economically viable and may rely on such investments only at the initial stages.

In some cases, when economic parameters do not allow for a full economic self-sufficiency of a community-based conservation initiative, subsidizing running costs of operations should be considered. CBWM provides conservation benefits beyond the immediate local community and such subsidies would likely be less costly and more efficient than paying for enhanced enforcement of wildlife protection by state rangers alone. Such investment will not only support species conservation, but also directly benefit people living in proximity to wildlife habitat, creating positive attitudes towards wildlife and strengthening their support for wildlife conservation. This can potentially mitigate human-wildlife conflicts and decrease poaching or even avoid it completely (see section 3.3 for examples).

- Consider the economic benefits of CBWM in decision making as an incentive for improved conservation of wildlife and its habitats as well as a contribution to rural development.

Consideration of extractive use

Any consideration of approaches for wildlife use needs to be based on the conservation status of the species and the actual threats. Applying CBWM for developing sustainable, extractive use should be considered even for small and/or declining populations if there is a high probability of

a positive net conservation impact. This is likely to be the case when the planned use can be organized in such a way that will not harm the population and will lead to the reduction of identified threats. For instance, strictly regulated trophy hunting targeting only very few old males of a polygynous ungulate species per year can be feasible and beneficial, if set up in a way that effectively prevents poaching of the same or a greater number of animals. Even if such use is currently considered impossible due to small population size and/or legal barriers, realistic use perspectives for the future, for example, once the population recovers to a certain level, can provide an incentive for the engagement of local stakeholders and development of CBWM. Decisions about extractive use should always be based on reliable data about the specific population and a thorough analysis of the potential impact of extractive use on the population dynamics following the highest scientific standards in order to avoid threatening the survival of the population.

- Consider sustainable, extractive use as a measure of wildlife conservation and base decisions about this on good science.

Red books

The approach of Red Books listing rare and endangered species, which is commonly used in the target countries and puts the listed species under strict protection, should be reviewed. Listing criteria and categories should be based on the Guidelines for Application of IUCN Red List Criteria at Regional and National Levels (IUCN, 2012). Red Books should guide species conservation planning and regulations in a transparent and predictable way, effectively addressing identified threats. Limited extractive use possibilities of some Red Book listed species may provide an incentive for local people to protect these animals, especially in situations where current patrols are not able to effectively prevent poaching and allow for population recovery (see Chapter 3).

- Bring species' assessment procedures for Red Books in line with IUCN guidelines.
- Consider allowing limited extractive use of selected Red Book listed species, if it can be shown that this will contribute to the conservation of the species.

Hunting bans

Blanket hunting bans bear high risks of removing effective conservation incentives and thus causing adverse effects on species conservation (see Section 3.4.4). Such hunting bans can potentially heavily affect CBWM initiatives which rely on income options from sustainable extractive use. They should therefore be considered only for species which are threatened by actual or potential legal hunting and where a better regulation of legal hunting is either not suitable for achieving the conservation of this species or such regulation cannot be effectively enforced. For instance, species with a very low reproduction and naturally long lifespan like Great Bustard *Otis tarda* are not well suited for regulated sustainable hunting.

- Review existing laws to establish hunting bans only for species threatened by legal hunting. Specifically, give preference to better regulation and control of hunting and consider removing existing hunting bans, which contradict conservation needs and CBWM.

Zakazniks

The regulations for zakazniks (nature sanctuary, conserving one or several species) and other protected areas with regulated use should be revised to remove adverse incentives that favour

land use practices which negatively affect wildlife habitat. In zakazniks and similar protected areas with regulated use, where the conservation of huntable species is a purpose, the sustainable use of these species using CBWM approaches should be made possible if it can be shown to contribute to the conservation of the species on a case by case basis, while it should be possible also to ban or restrict land use that is harmful to these species or their habitats, like livestock grazing. These changes could significantly improve the conservation of such areas and wildlife inhabiting them.

- Review and consider changing legislation on zakazniks and similar areas: 1) to allow the sustainable extractive use of target species, e.g. through a CBWM approach and 2) to ensure that any land use in this area is not harmful to wildlife.

Involvement of communities in conservation

Community-based conservation requires active involvement of those community members, who are potentially interested in wildlife, in particular of traditional – formal or informal – hunters. Involving those who are able to stop illegal and unsustainable use means also approaching people, who may have been directly involved in poaching.

Drawing the line between (potentially) legitimate users and non-legitimate users can be challenging and various aspects of legitimacy, readiness to participate in legal sustainable use and the acceptance by the broader collectives need to be taken into consideration. Discussions with local people need to be facilitated in a participatory way. Interested community members need to be supported in the development of suitable local institutions preferably as local non-commercial, non-governmental organizations or in engaging official local self-governance bodies and their substructures (e.g., pasture committees). The involvement of the broader community instead of focusing only on a typically narrow circle of hunters can be beneficial for achieving community acceptance, support, benefit sharing and social control. However, such broad involvement may also cause insufficient ownership feeling by the involved hunters and thus may reduce their motivation and compliance.

- Encourage the creation of non-profit NGOs on a community level as entities for wildlife management and conservation.

Hunting areas assigned to community-based non-profit organizations

In Central Asia, hunting concessions run by both commercial enterprises and community-based non-profit NGOs set up by local people exist. Both models can complement each other, and their co-existence should be made possible. Depending on the specific conditions, one or the other approach might be locally more suitable. Due to their roots in local communities, these NGOs are well suited for implementing CBWM and are particularly effective in cases of a strong community cohesion. Such approaches should be organized in an inclusive and transparent way and ensure that revenues are largely used for conservation and community benefits. Commercial enterprises could be more effective than community-based NGOs, in particular where community cohesion and social control are weak. Governments need to set rules for the assignment of hunting grounds and the allocation of hunting permits, which are equitable and

transparent and ensure the rule of law, so that entities holding wildlife management areas are motivated to invest in the conservation and recovery of wildlife and its habitats.

- Promote and support the management of hunting areas by non-profit community-based NGOs as a complementary approach to concessions run by commercial enterprises.
- Review legislation and administrative practices and change them as needed to make it easier for community-based NGOs to be assigned wildlife management areas.
- Consider decreasing the level of monetary liability for poaching by third parties for non-profit NGOs managing hunting areas, where relevant.

Delineation of hunting areas

Effective wildlife management requires the delineation of meaningful management units, in particular, if it includes sustainable extractive use. These units may be determined by the spatial requirements of a used part of a population of the target species. For mountain ungulates this can be several ten thousand hectares, depending on the topography and available habitat features. For Saiga this can be hundreds of thousands of hectares, while for Bukhara Deer several hundred hectares may suffice. The management units should also be in accordance with the areas traditionally used by the respective community or group of communities for livestock grazing, agriculture, hunting and other activities. Furthermore, administrative and natural boundaries can be useful for the delineation of hunting areas. These boundaries should be recognizable in nature to avoid conflict. In optimum situations such management units even coincide with habitat sections permanently or seasonally used by certain subpopulations of the main target species. Too small hunting grounds cannot harbour enough animals allowing sustainable use and may motivate unsustainable first-come, first-serve attitudes towards hunting. Too vast areas in turn would require the involvement of people from very different communities, causing difficulties in establishing joint institutions, internal competition and conflict.

Where highly mobile wildlife with large spatial requirements and unpredictable or seasonally varying use of space is to be managed, the distribution range will likely be divided into manageable units like hunting areas or community areas and the creation of associations or networks of these units can be necessary. As costs of co-existing with wildlife (for wildlife protection and impacts of wildlife on land use) as well as benefits from its use are typically not equally distributed across the population range and also not highest at one location, these associations will help to assess costs and benefits across the range and ensure that they are equitably distributed among all members of the association following commonly agreed criteria.

- Review existing and develop new wildlife management areas, making sure that these areas are of adequate size to manage wildlife species, taking into account boundaries of community lands, administrative units and topographic features.
- Encourage the creation of associations of wildlife management units for managing wide-ranging species.

Support for wildlife tourism

As shown in this study, wildlife watching has great potential as an incentive for conservation but is not widely applied in the region. Some successful examples of wildlife-watching tourism exist in target countries (see Sections 3.4.3 – 3.4.5), but greater opportunities are often not used due to certain barriers, some of them caused by current legislation. For instance, the managing entity of a wildlife management area cannot exclusively offer wildlife watching tours inside the area. Any other organisation or individual is legally allowed to conduct touristic activities in such areas without having to bear the costs of wildlife management. Other barriers include the lack of touristic infrastructure, business plans or good marketing. The reason for this is mostly a lack of funding and limited capacity of interested organizations, including community-based organizations. In order to address this, it would be advisable to develop state funding programmes, which aim at developing wildlife tourism in Central Asian countries. These can be part of general tourism programmes or of programmes for the development of rural areas as they already exist in some countries. Such funding could be accompanied by capacity-building for local communities interested in developing touristic offers and capacity-building for decision makers. These offers can be developed in co-operation with protected area staff, which would increase the attractivity of such areas for tourists. Such programmes can incentivize coexistence between wildlife and people, support protected areas and mitigate human-wildlife conflicts.

- Amend legislation on non-extractive use of wildlife granting managing entities of wildlife management areas exclusive rights to offer tourism services in these areas.
- Develop and implement state funding programmes to support the creation of wildlife tourism offers in the countries of Central Asia.
- Offer capacity building and financial support for the development of environmentally friendly wildlife watching tourism businesses to local communities.

Private or community-based protected areas

In general, control of land use is beneficial for the conservation and management of wildlife to enable the managing entity to restrict practices harming wild animals or their habitats. This is particularly relevant where non-extractive use (e.g. wildlife watching) is identified as a wildlife management priority for a certain species or area, as the success of such activities depends on thriving populations of wildlife. Already now, communities in Central Asia can become responsible for wildlife management areas (hunting areas) and thereby control wildlife, but without any authority to manage land use. This can lead to contradictory management goals of agricultural users and wildlife managers. The creation of protected areas managed by private entities, such as organizations formed by local communities can be a useful alternative, following the example of the conservancies in Namibia (see chapter 3.3.2). For the manager of this private or community-based protected area, the main obligation would be to conserve wildlife and its habitat. The managing organization should have the right to use wildlife and its habitat exclusively or make decisions about their use by others. This would allow to manage land use in a way that is beneficial for the development of rich wildlife. Wildlife watching and other nature-based tourism could be the main economic basis for the management of such private or community-based protected areas while hunting may be allowed if suitable populations of huntable species are present.

However, such a model would require legal changes in all Central Asian countries, as protected areas are in general controlled only by governmental agencies, with the exception of Kyrgyzstan, where also local communities can manage protected areas (see 3.4.4). In contrast, in Kazakhstan,

the only legal way to establish a private or community-managed protected area is to get a hunting area assigned and strictly limit hunting, although in this case, the managing organization has no control over land use, but has only the right to use and the obligation to protect the wildlife in the area. This approach can be very challenging for the managing NGO, as ACBK's experience of running an assigned hunting area as an "Ecological Park" has shown (section 3.4.5).

As private or community-managed protected areas can be an effective conservation tool, which, compared to wildlife management areas based on the hunting legislation, can address habitat conservation, their creation should be considered in the Central Asian context despite required, significant legal adaptations.

- Consider privately managed protected areas as a measure to achieve the CBD Kunming-Montreal Global Biodiversity Framework goals on area conservation ('30 by 30' target).
- Change the legislation to allow for the creation of private protected areas, where both wildlife and land use should be managed by the organization in charge of the area.
- Identify obstacles for the management of protected areas by non-profit organizations and address them.

5.2 Recommendations to Parties of UN Conventions and concerning the involvement of IUCN

5.2.1 To CMS Parties

In general, community-based approaches are not considered in the CMS Convention text, but are mentioned in some species- or region-specific CMS instruments. For example, in the context of CAMI, Resolution 11.24 (Rev. COP13) contains activities to assess the feasibility of sustainable use of CAMI species across the region, looking at accruing benefits for local communities, as well as relevant legislation, and to promote non-extractive use especially community-based ecotourism within the CAMI region and develop sustainable ecotourism programmes.

The International Single Species Action Plan for the Conservation of Argali (Mallon et al, 2014) mentions the benefits of well-managed trophy hunting as well as issues of insufficiently transparent use and allocation of the proceeds from the sale of the hunting permits, particularly towards local communities. It includes an entire Result 1.2 "Argali is used and managed sustainably, with support of local communities", including measures to involve local communities formally in the management and sustainable use of Argali and their habitat, to promote long-term assignment of management rights to communities and others. However, the implementation of this Action Plan and in particular of the aspects related to local community engagement in wildlife management has proven challenging.

In the action plans for Bukhara Deer and Saiga Antelope community-based approaches and sustainable use would deserve more explicit consideration. During the past meetings of Signatory States to Bukhara Deer MOU and Saiga MOU and technical workshops hesitation prevailed among participants, in particular from Range States, to suggest or adopt such approaches. Greater awareness of CBWM may be beneficial and may enable Range States in Central Asia to consider developing respective policies to compliment ongoing conservation activities. This study shows that community-based wildlife management with non-extractive and extractive use can have significant benefits for the conservation of CMS-listed species, when preconditions described in Section 3.1 are met (see also species-specific examples in section 4). The authors

conclude that CBWM with extractive and non-extractive use should receive greater consideration as an incentive for conservation of large mammals in the CMS context and make the following recommendations to CMS Parties.

- Fully implement actions related to CBWM from the CAMI POW and the International Single Species Action Plan for the Conservation of Argali.
- Evaluate the potential of community-based approaches for ecotourism and hunting tourism to improve the conservation of migratory species and their habitats in and also beyond Central Asia and include CBWM in relevant CMS instruments.
- Evaluate experiences of other Conventions (e.g. Vicuña Convention and other relevant policy frameworks) in addressing grazing competition as a threat to migratory species in Central Asia (Section 3.3.3).
- Request the CMS Secretariat to conduct capacity-building activities to inform decision-makers about CBWM approaches, their benefits, associated risks and pre-conditions for success.

CMS- listing of Bukhara Deer

The CMS Convention text allows extractive use of CMS species listed on Appendix II and requires CMS Parties to prohibit taking of Appendix I species. For the Bukhara Deer the current CMS Appendix I listing may pose an obstacle to developing economically viable community-based management or other management approaches including the take of the species. Take of Bukhara Deer may become necessary due to the overstocking of protected areas and human-wildlife conflict outside protected areas. In accordance with CMS Convention text Article III, paragraph 3 a migratory species may be removed from Appendix I when the Conference of the Parties determines that:

a) reliable evidence, including the best scientific evidence available, indicates that the species is no longer endangered, and

b) the species is not likely to become endangered again because of loss of protection due to its removal from Appendix I.

According to the IUCN Red List, Bukhara Deer is a synonym or potentially a sub-species of the Tarim Red Deer (*Cervus hanglu*), listed as Least Concern since 2017 with an increasing population trend. Therefore, as Bukhara Deer is not endangered, a possibility of removing Bukhara Deer from CMS Appendix I can be considered.

- Bukhara Deer Range State Parties to consider delisting Bukhara Deer from CMS Appendix I and maintaining it only on Appendix II in accordance with the listing criteria and the current conservation status of the subspecies, e.g. to enable CBWM with extractive use in the future.

5.2.2 To CITES Parties

Recommendations in relation to CITES are currently only relevant for one of the focal species of the study, the Saiga Antelope. Application of community-based wildlife management either of extractive nature or with respect to observations of Saiga in their natural habitat will require research, marketing and development of touristic offers, setting up new management structures and control mechanisms, which involves substantial investment. International trade in Saiga products, if well-managed and strictly controlled, can provide a source of income for investing in community-based initiatives in Saiga habitat.

Currently Saiga is listed on CITES Appendix II with the following annotation: "A zero export quota for wild specimens traded for commercial purposes." In contrast to national laws, which can be amended rather easily by one country alone, changes in the status of Saiga under CITES can only be approved by the COP, meaning that CITES Parties need to be convinced that changes are needed. With this annotation, sufficient monetary benefits for economically viable conservation and management of the species cannot be generated and require significant investments from the state budget.

Removing this annotation can allow international trade. In case international trade in wild specimens becomes possible, generated revenues should be shared with local communities in the Saiga range. Such benefits for local people have the potential to create positive attitudes towards Saiga, mitigate conflicts, help to prevent poaching and motivate people to tolerate Saiga on their land. The money earned from international trade in Saiga products will allow manifold investments as compared to the current trade ban, which can be a source of funding for conservation and local community development (Section 4.2.2). Income from legal trade would make Saiga an economically viable element of land use, thereby providing important incentives to conserve Saiga and its habitat.

For international trade to happen, an effective stockpile management system for Saiga horn needs to be in place. The proponent of the potential removal of the annotation to the Saiga listing will also need to produce a well-designed sustainable use plan for Saiga and establish a market and trade control system, including a system for marking horn to ensure that the use of Saiga is well controlled, legal and sustainable.

- Consider proposing to delete the current annotation of the zero export quota for wild Saiga specimens traded for commercial purposes under CITES and request advice of the CITES Secretariat on the procedure for doing so.

5.2.3 Concerning IUCN

The IUCN Sustainable Use and Livelihoods Specialist Group (SULi) is a global volunteer network formed by the International Union of Conservation of Nature (IUCN), as a joint initiative of the Species Survival Commission (SSC) and the Commission on Environmental, Economic and Social Policy (CEESP). It aims to mobilise global expertise across the science, policy and practice sectors to address the urgent challenges of overexploitation of wild species and support robust, equitable models of sustainable use that meet human needs and priorities.

Members of IUCN SSC SULi were actively involved in raising awareness about CBWM around the world and in Central Asia (see Section 3.2) and ensuring that Central Asian experience is known in the international context, e.g. by including case studies from Central Asia in the selection of CITES and Livelihoods case studies. IUCN SULi and other taxa specific IUCN SSC specialist groups

have provided expert advice and technical guidance to governments of the Central Asian countries in the CMS and CITES contexts.

The IUCN SSC Human-Wildlife Conflict & Coexistence Specialist Group (HWCC SG) is an interdisciplinary expert-based advisory group that aims to support professionals working on human-wildlife conflict and coexistence by providing interdisciplinary guidance, resources, and capacity building. The group's objectives are to: 1) act as an advisory body on matters of human-wildlife conflict and coexistence that can provide a platform for the exchange of best practice; 2) facilitate interdisciplinary approaches to human-wildlife conflict mitigation by encouraging the collaboration of experts from many different fields; and 3) build capacity by developing technical or framework guidance materials, training workshops and learning platforms.

The HWCC SG has not yet been extensively involved in Central Asia, despite many (emerging) instances of human-wildlife conflict in the region. Parties in Central Asia may consider actively engaging this group of experts to receive advice on managing human-wildlife conflicts through a well-informed, holistic, and collaborative process that takes into account underlying social, cultural and economic contexts.

Conservation policy relies on regular assessments of the conservation status of the species by the IUCN. The IUCN Red List assessment of Tarim Red Deer, of which Bukhara Deer likely is a subspecies (see section 2.2.4 for current status), should be reviewed soon, which might open up more options for community-based wildlife management as discussed in this study.

- IUCN SULi and SSC specialist groups should continue providing technical support to CAMI Range States on CBWM approaches;
- IUCN SSC Deer Specialist Group to review IUCN Red List assessment of Bukhara Deer to inform the development of conservation and management measures.
- CAMI Range States to consider engaging the IUCN SSC Human-Wildlife Conflict & Coexistence Specialist Group to receive advice in managing human-wildlife conflicts in Central Asia;

5.3 Recommendations to Range States for each target species

5.3.1 Saiga Antelope

Saiga Antelopes have a wide range, migrate far distances every year and occur in large herds in several populations. Therefore, they also impact the lives of many people. In order to ensure a positive attitude of local communities towards Saiga, it is an essential step to involve them in Saiga management through appropriate co-management and benefit sharing systems and to support the development of non-extractive use (see also Milner-Gulland et al., 2020). Several possible solutions for this are provided in the following paragraphs, for details please see CMS (2023). One of these options for involvement of local communities will likely not be sufficient incentive by itself, but in combination could help to create ownership, and a positive attitude of local people towards Saiga conservation and to mitigate conflicts, bringing large benefits for Saiga conservation.

Saiga watching tourism

As discussed in Section 4.1.1, non-extractive use in the form of wildlife tourism requires substantial initial investments. A state support programme could serve as catalyser for the development of tourism infrastructure and marketing. Prior to supporting certain projects, an analysis of the economic viability should be conducted. Not all locations and approaches have the potential to attract a sufficient number of tourists and produce sufficient revenues to cover all costs as well as provide benefits for local people. The involvement of local people should always be a criterion for granting support.

- Assess feasibility of community-based eco-tourism with Saiga observation tours in specific locations and provide support for respective business development in most promising locations.

Saiga management councils

The application of the CBWM approach requires that decision-making involves local communities in order to create ownership and a wide understanding and local support for management decisions and also involvement of other stakeholders in a participatory approach (see section 4.1.2). This can be achieved by the creation of management councils, which include representatives of wildlife management authorities on national and regional level, wildlife protection service, protected areas, hunting areas, relevant NGOs, scientists as well as local communities. Such councils should exist for every Saiga population separately due to the specific conservation context of each population. Local communities or rather their associations or networks would send delegates to such councils.

- Create management councils for each Saiga population with representatives from all relevant stakeholders, taking decisions about management questions like sustainable use, monitoring and addressing threats.

Hunting tourism in wildlife management areas assigned to local communities

In order to allow hunting areas in the Saiga range, particularly the ones managed by local community-based NGOs or associations of such NGOs from several villages, to gain sufficient income to compensate costs for anti-poaching patrols and habitat protection, limited hunting

tourism should be considered as a possible option. Such limited hunting can in the end benefit Saiga conservation, as local people will feel ownership of Saiga and be motivated to prevent poaching by organized criminal groups of commercial poachers. Such hunting areas managed by local community-based organizations would have the opportunity to get hunting quotas from the state and use them to develop hunting tourism.

- Consider the feasibility of trophy hunting tourism as a source of income for hunting areas in the Saiga range area, particularly for the ones assigned to local community entities.

Hunting permits for local communities

In order to enable benefit flow to local people from large numbers of Saiga and the potential large-scale hunting, distribution of hunting permits to local communities for subsistence in the Saiga range for free or at low prices should be considered, which would allow them to hunt a certain number of animals in proportion to the community size and the importance of the area used by it for Saiga conservation. It is recommended to issue these permits for hunting at a certain hunting area with sufficient numbers of Saigas present during the hunting season. No trade in Saiga products from these hunts should be allowed and anti-fraud mechanisms should be in place.

- If Saiga are hunted commercially on a large scale, some hunting permits for subsistence should be provided to local communities from within the Saiga range allowing them to hunt Saiga at selected hunting areas, where Saiga live during the hunting season.

Subsidised meat for local communities

If the provision of hunting permits is not feasible, or as an addition to hunting permits, other ways of benefit sharing should be considered. A potential future large-scale commercial use of Saiga will produce considerable amounts of Saiga products, especially meat. It would be attractive for local people if they would get Saiga meat in significant amounts for a low price at self-costs or even subsidized so that they have a supply of meat for some time of the year. This can help to create positive attitudes towards Saiga and its conservation and help to solve conflicts and mitigate poaching.

- In the case of large-scale, commercial Saiga use, consider the provision of subsidised meat to local people as a benefit-sharing mechanism, which can easily be implemented.

Sharing revenues with local communities

Through selling Saiga products from large-scale, commercial hunting the state will earn significant amounts of money, if international trade will be allowed in the future. Stakeholders from the Saiga range like local communities and wildlife management areas should receive a certain share of these revenues, which they can use for Saiga protection, community development and social projects. These revenues should be distributed through a commonly agreed mechanism across the range of one population in order to let all stakeholders equally benefit from it. The creation of a fund with money for distribution to local communities should

be considered, collecting the share of revenues from Saiga use for local communities. For details see Chapter 4.1.2.

- Share future monetary revenues from large-scale Saiga use with wildlife management areas and local communities through a well-defined and transparent distribution mechanism;
- Consider the creation of a fund to support local communities, collecting revenues from commercial Saiga hunting and trade and distributing them to local communities.

Collection of horn

The collection of Saiga horn from natural mortality should be allowed with the requirement that detected horn has to be delivered to certain collection points or Saiga management authorities. If sold through future international trade, 100% of the gained income from collected horn should go into a fund, which finances local development or social projects in the Saiga range. A reward directly for the collector should be avoided. However, risks of misuse of such an opportunity remain and proper control mechanisms (proof of natural mortality through geographical coordinates, photos, and thorough horn examination) should be in place to check if the horns are really from natural mortalities.

- Establish control mechanisms and collection points for horns from natural mortalities;
- Allow collection of horns, resulting from natural mortality, if effectively controlled, to increase benefits for local communities.

Legal international trade

To achieve maximum economic benefits to set off the costs of Saiga protection and of coexistence of rural people and their livestock with Saiga, strictly controlled legal international trade in Saiga products should be developed and illegal trade be effectively prevented. Saiga meat might be the first product for trade (Milner-Gulland et al., 2020), but horns would provide significantly more revenues. However, before CITES annotations can be changed, an adaptive Saiga population management with accurate Saiga population monitoring needs to be in place as well as a stockpile management system including an internationally accepted method for horn tagging to prevent the laundering of illegally obtained horns. For more details see Milner-Gulland et al. (2020).

- Establish adaptive management of Saiga based on reliable and comprehensive population monitoring;
- Establish effective mechanisms for Saiga horn stockpile management including marking and registration;
- Coordinate with other range states all measures for preparing international trade in Saiga products;
- Develop a proposal for removing the CITES annotation of a zero quota for commercial trade in wild-sourced Saiga products and advocate for its approval by the CITES Conference of the Parties, based on proven mechanisms for effective control of legal harvest and trade and the prevention of illegal trade and laundering of illegal Saiga horns.

5.3.2 Argali

Touristic offers based on wildlife watching including Argali managed by community members and their organizations should be supported to incentivize the protection from poaching and other threats. Some successful examples have shown the potential of touristic offers, which should be extended to other areas (see Sections 3.4.3 and 4.2.1).

Argali is a highly attractive huntable species, whose trophies are traded internationally. As described in Section 4.2.2 where Argali hunting is allowed in Central Asia, commercial hunting concessions manage most hunting areas with high Argali numbers. Governments should consider making more hunting areas with current or previous Argali occurrence available for community-based initiatives to complement the commercial concession approach. For example, hunting areas with currently low Argali numbers, irregular occurrence or potential for recolonization could be assigned to community-based organizations. This would contribute to higher connectivity among Argali populations and to the restoration of the former range area. Hunting quotas should be allocated to the organizations responsible for certain wildlife management areas if Argali populations meet biological conditions, explained in Section 4.2.2.

- Support the development of community-based wildlife watching offers including Argali through initial investment and assistance in tourism product development and marketing, ensuring the link between benefits and conservation efforts;
- For extractive use, assign more suitable areas with potential for Argali management to community-based entities;
- Allocate hunting quotas to community-based entities managing hunting areas when Argali numbers there have reached established thresholds.

5.3.3 Snow Leopard

As human-wildlife conflicts with livestock herders are a major threat for Snow Leopard, its conservation would greatly benefit from a mitigation of this conflict and parallel non-extractive use through nature tourism. Successful examples of community-based ecotourism from the Snow Leopard range should be replicated in the target countries of the study.

Already existing measures to mitigate human-wildlife conflicts are predator-proof corrals, protective herding technique, and livestock insurances, which can weaken the perception of Snow Leopards by local people as a danger for their livelihood. If CBWM can be applied to the development of ecotourism offers to the Snow Leopard as additional source of income, the attitude of local communities towards the presence of the large predators can even turn to a positive one, which would be a benefit for the conservation of the species.

CBWM with extractive use of the Snow Leopard's ungulate prey can set powerful incentives for the protection of these species from poaching and for conservation of their habitat, solving thereby the problem of a lack of prey for Snow Leopards. For this reason, areas outside of protected areas with strict and well-enforced hunting bans could be assigned as wildlife management areas. Commercial hunting enterprises as well as community-based organizations should be provided with opportunities of getting such areas assigned. Sport hunting quotas for trophy hunting of the Snow Leopards' ungulate prey should be allocated to community-based

and commercial entities holding wildlife management areas on the basis of biological conditions and population characteristics of the huntable ungulates (see Section 4.2.2).

Additionally, or as alternative approach, quotas might be set for domestic sport and subsistence hunting of Asiatic Ibex, targeting other sex and age classes (not suitable for trophy hunting), in particular young males. Such hunting may provide additional benefits from wildlife for local people and ultimately for conservation, if well-managed to avoid overharvest, but inevitably will lead to a greater off take of animals. Therefore, domestic hunting for subsistence and sport should be made possible only in areas where population size is at carrying capacity applying a very conservative approach, and the allocation of quotas should be carefully considered in a participatory decision-making process by the entity holding the wildlife management area.

To improve the availability of natural prey of Snow Leopards, grazing management needs to be improved in many areas. Restriction or exclusion of livestock grazing in areas which are assigned for CBWM should be made possible. This can be done through temporary or long-term lease of pastures by community-based organizations and other holders of wildlife management rights and through changes in legislation, where necessary.

- Support human-wildlife conflict mitigation measures in the Snow Leopard range financially and technically;
- Consider enabling the creation of private protected areas and community-based tourism development to support conservation of Snow Leopard habitat;
- Consider CBWM approaches with extractive use of Snow Leopard's prey species (Ibex, Markhor, Argali, etc.) to support conservation;
- Provide limited hunting quotas for old male ungulates of Snow Leopard's prey species to holders of wildlife management areas in the (potential) Snow Leopard range in accordance with scientific standards, so as not to harm the population;
- Allow limited domestic hunting of Snow Leopard's prey species only in areas with high densities;
- Allow for a long-term or temporary lease of pasture by holders of wildlife management areas to influence land use for the benefit of Snow Leopard's prey species.

5.3.4 Bukhara Deer

Wildlife watching

This rather big and – in absence of poaching – not very shy animal is attractive for people, especially in combination with its preferred biotope – riparian forest (tugay). The possibility of wildlife watching tourism offers with Bukhara Deer and the application of CBWM to their development should be further explored and tested. In Kazakhstan, such options might be especially promising for two newly established groups: in Ile-Balkhash reserve and in Turkestan forestry in the Syr Darya valley. Both areas are suitable for tourism, and local communities will profit from the provision of services for tourists, selling of products etc. Some touristic offers in Bukhara Deer habitat are also being developed in Uzbekistan.

- Support the development of eco-tourism based on Bukhara Deer observations in their natural habitat with the involvement of local communities

Extractive use

In terms of extractive use, the strict protection status of Bukhara Deer in the Range States should be reviewed, considering the IUCN Red List assessment and the overstocking of several protected areas, causing habitat degradation. Enabling legislation needs to be developed in all range states.

Depending on the situation of a specific population, sustainable use in form of different types of hunting can be considered (see section 4.4.2 for details), if the species is removed from CMS Appendix I. This would allow for the development of CBWM with extractive use to improve the conservation of the species and its habitat. At the national level, to allow hunting exceptional permits on the basis of government decisions should be considered in the short term. In the mid- and long-term either a general change of the legal implications of Red Book listing or a removal of Bukhara Deer from the Red Book are options that would make it a huntable species.

For different types of hunting, local communities need to be involved or at least benefit from the revenues obtained. This would also create a benefit for conservation, as conflicts would be mitigated, reducing the poaching pressure on the deer. The farming of Bukhara Deer for antlers and other purposes which is currently one of the measures included in the CMS Bukhara Deer MOU's Action Plan is not advisable, as is associated with high risks and many problematic issues involved with this approach as outlined in section 4.3.4.

- Consider necessary legal changes to allow hunting of the deer, if removed from CMS Appendix I, e.g. exclusion of the species from Red Books, transparent procedures for setting quotas and receiving permits;
- Consider CBWM with trophy hunting of single males in populations of at least 100 recorded animals and a sufficient share of adults;
- Consider hunting for sport and venison particularly where reduction of population sizes is desirable to avoid habitat degradation;
- Involve local communities in managing Bukhara Deer to pilot CBWM with a perspective of future extractive use or at least share benefits from hunting with local people;
- Prevent farming of Bukhara Deer.

New wildlife management areas for Bukhara Deer

Areas outside of protected areas, even those with suitable habitat are usually not inhabited by Bukhara Deer mainly due to poaching pressure. These areas either with actual or potential future presence of Bukhara Deer should be assigned as wildlife management areas to interested entities, preferably established by local people to pilot CBWM. When the conditions for sustainability are met and legislation allows, these entities should get quotas for Bukhara Deer hunting, based on scientific criteria. The permission to use a set amount of animals could be linked to the obligation to conserve and restore Bukhara Deer habitat or part of the revenue earned could be directly invested in restoration measures. This would also help biodiversity conservation in general.

- Create new wildlife management areas with future perspectives of Bukhara Deer use outside of protected areas;
- Consider ways to use CBWM approaches as a contribution to Bukhara Deer habitat conservation and restoration.

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