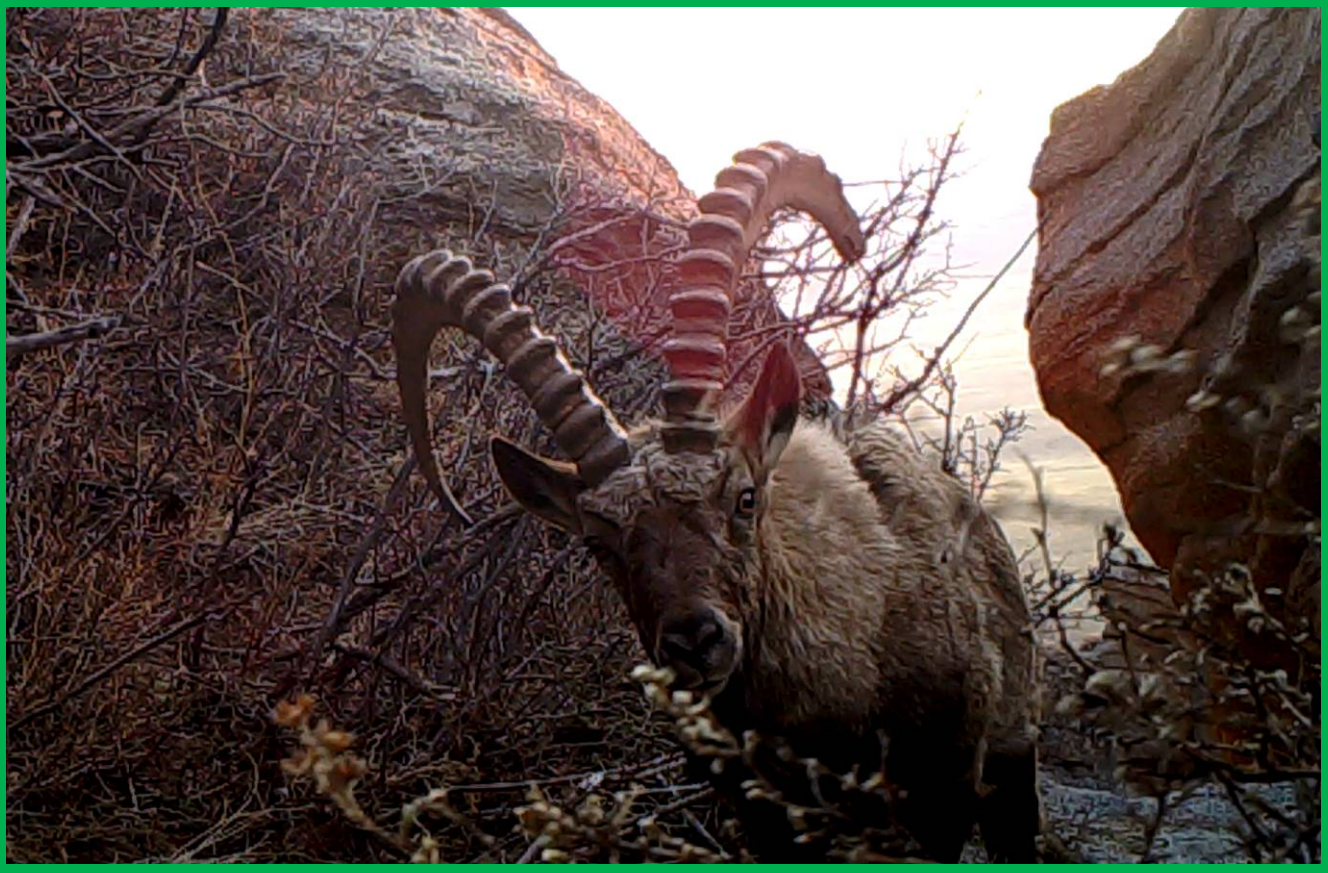

The Siberian Ibex (*Capra sibirica, Pallas 1776*) in Mongolia: A Survey on Exploitation and Trade, and Considerations for Future Management

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Cover image: Siberian ibex (*Capra sibirica*, Pallas 1776) trapped by our camera trapping, during a current project of big ungulate monitoring by camera trapping in Bayan Onjuul soum, Tov province, Mongolia.

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Acronyms

CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
ECU	Eurasian Customs Union
EU	European Union
IUCN	International Union for Conservation of Nature
MNET	Ministry of Environment, Nature and Turism
NGO	Non Government Organization
UN	United Nations
WCMC	World Conservation Monitoring Centre

Glossary

Aimag refers province that is an administrative unit. Mongolia has 21 provinces.

Soum refers rural district of Mongolia within the province. There is over 360 soums for 21 aimags of Mongolia.

Change refers a commercial agent as middleman between herders, foreigners, and factories etc.

Acknowledgement

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Summary

Central Asia has a wide variety of charismatic species, which find here the last huge uncontaminated areas, where they can survive reducing the contact with the human species. The wildlife is of great relevance for the region's economy, and new challenges are faced with regulations for wildlife use and trade in order to prevent illegal and unsustainable practices, locally and internationally.

The open borders in the regional economic integration zones as the EU and ECU in Eurasia, the online trade, which has been rapidly developing in the recent years, the fast economic growth occurring in many of the Central Asia States, may threaten the conservation of Paleartic wildlife.

Mongolia, is a symbol of the Central Asia economic development and may have greater difficulties than others countries to deal with the recent global and local changes. Its position between two superpowers like Russia and China, and being a land-locked country with extremely poor infrastructures with around 40% of the population living in the capital city Ulaanbaatar, let infer the difficulty on wildlife management and protection implementation.

The country is still trying to find the best way to manage its natural resource since the socialist system collapsed. Already during the socialist time use of wildlife was widespread, but under a strict management by central and local governments. After the effects of the socialist system vanished in the second half of 1990^{s}, the wildlife use and its international trade, were uncontrolled. Mongolians did not need visas to enter China, and individuals as well as companies started to export any item into a market which was ready to take whatever item was offered.

Nowadays Mongolian wildlife products are sold all over the planet, and therefore it is necessary to obtain a clearer idea of the international trade framework. It is also important to focus on species which are not protected internationally and try to understand their position in trade during the past socialist system and the new consumerism and globalization.

The aim of this survey is to analyze the Siberian Ibex (*Capra sibirica*) trade, investigating the past and current use and management of this species.

During the last two decades, there has been an ongoing international trade in Siberian Ibex Wool, known as "Yangir", which is originally the name of Siberian ibex in Mongolian language. This current trade with Yangir is also found commonly on internet online shopping sites.

Our survey confirmed that the current stock of cashmere wool in trade originated from Siberian Ibex, and with high probability derived from the collecting system dating back to the socialist time in the late 1990s and at the begin of the XXI century.

Nevertheless, commercial trade of "Yangir" cashmere is still active mainly in Western Europe. Depletion of the present stock could require new scenarios for restocking the international trade in future. This may threaten Siberian ibex, which already experienced a substantial decline in the recent past and is dealing with many other human and natural threats at present.

In conclusion, monitoring the trade of the Siberian Ibex products , and verifying the depletion of the initial stock depletion is necessary. We further need to investigate if any new stock of wool will feed the commerce in future.

1. General information about Siberian Ibex

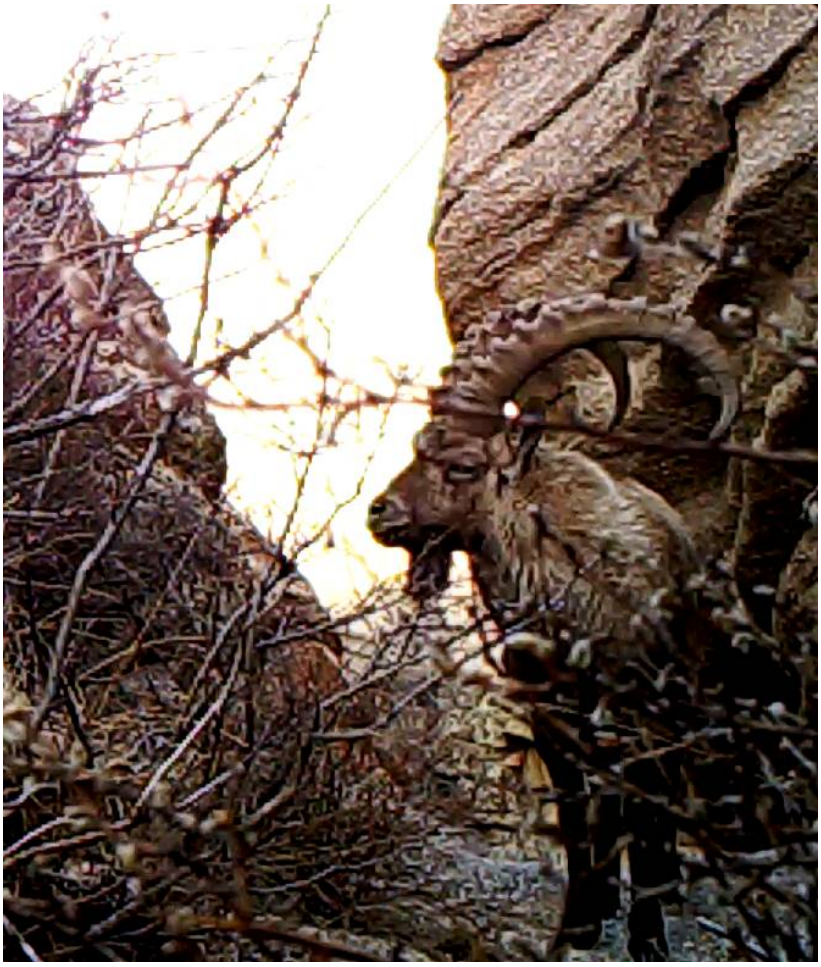

Figure 1- Siberian ibex (*Capra sibirica*, Pallas 1776) trapped by our camera trapping, during a current project of big ungulate monitoring by camera trapping in Bayan Onjuul sum, Tov province, Mongolia.

1.1. Taxonomy

Currently, four subspecies of Siberian Ibex are recognized: *C. sibirica sibirica* (Pallas, 1776) in the Altai Mountains, *C. s. hagenbecki* (Noack, 1903) in the Mongolian Gobi, *C. s. alaiana* (Noack, 1902) in the Tian Shan Mountains, and *C. s.*

sakeen (Blyth, 1842) in the Karakorum, Pamir, and Hindu Kush mountains (Fedosenko & Blank, 2001) (IUCN, 2014). They are differentiated primarily by differences in size, colour, and horn characteristics (Fedosenko & Blank, 2001). Some authorities recognize at least one more subspecies, and some are not certain that it is a separate species from other ibex. At present the IUCN considers it separate, though taxonomy is still not fully resolved (IUCN, 2014). More broadly, the taxonomy of the entire genus is highly disputed, with various authorities recognizing between 1 and 11 species, with 8 being the most common (Kazanskaya, Kuznetsova, & Danilkin, 2007). The recent mitochondrial DNA analysis found that *C. sibirica* was the most distant species in the genus, strongly supporting their status as a separate species (Kazanskaya, Kuznetsova, & Danilkin, 2007).

C. s. sibirica is the smallest of the subspecies, no more than 103 kg in weight. Male horns are 110 to 117 cm long. During winter males are light coloured. *C. s. hagenbecki* are similar in size to *C. s. sibirica*, but have longer horns (74 to 139 cm on males) with larger ridges, and are more grey or brown. *C. s. alaiana* is the largest subspecies, up to 130 kg for males. They have large horns, 100 to 147 cm long on males. During winter males are darker grey or brown. *C. s. sakeen* is similar to *C. s. alaiana*, but lighter, up to 90 kg for males. Their horns are slightly shorter (102 to 140 cm) but wider. Their colour is also lighter (Fedosenko & Blank, 2001).

1.2. Distribution

The Siberian ibex can be found in portions of Afghanistan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, and Uzbekistan. Across its range it is primarily found in mountainous and rocky terrain (IUCN, 2014).

In Afghanistan they are found throughout a large portion of the center of the country, in the Hindu Kush and Pamir mountains. In China they are found in limited portions of the west of the country, in the Altai, Tian Shan, Pamir, and Karakorum ranges in parts of Xinjiang, Gansu, Tibet, and Inner Mongolia. In India they are found in the Karakorum and Himalaya mountains in Jammu and Kashmir, Himachal Pradesh, and Ladakh. They are found in northern Pakistan, in the inner Himalayas, Hindu Kush, and Karakorum ranges. In Kazakhstan they are found in small portions of the southeast of the country in the Tian Shan and Altai mountains. They occur across almost all of Kyrgyzstan and Tajikistan, in the Hissar, Pamir, Tian Shan, and Alatau ranges. They have a limited range in far-eastern Uzbekistan, in the Tian Shan. They have a patchy distribution in south-central Siberian Russia, in the Altai, Sayan, and Tuva mountains (Fedosenko & Blank, 2001).

In Mongolia, they are found in much of the Altai and Govi-Altai mountain ranges, in parts of the Khangai Mountains, in some ranges in northwestern Mongolia (subspecies *C. s. sibirica*), and in isolated outcroppings and mountains in the Gobi (subspecies *C. s. hagenbeckii*) (Fedosenko & Blank, 2001) and Tov province (as we verified during the recent years). The director of the environmental office of Bayan Olgji talked about a subspecies or morphotype in his area. He referred to a so-called “Altai Yangir” which has a bigger size and more red colour, compared to other yangir in Mongolia. Until now there is not any scientific evidence for a different subspecies of *Capra sibirica sibirica* in the Altai Mountains.

1.3. Population

A rigorous global population estimate is not available, for most states where the species occurs (IUCN, 2014; Large Herbivore Network, 2014). In China there is a large population in the Tian Shan Mountains, up to 50,000 individuals. Kyrgyzstan and Tajikistan hold another large population, around 70,000. Other

range countries have smaller populations. Kazakhstan may have as many as 17,000. India has around 10,000 ibex, of which 6,000 are in Ladakh. It has likely declined severely in Afghanistan due to decades of civil conflict, but may still be numerous in the Wakhan Corridor. Pakistan, Russia, and Uzbekistan probably each have a few thousand individuals. However, many of these population estimates are 10 to 20 years old and may have lacked accuracy even at that time (IUCN, 2014). Mongolia used to have a large population, but the most recent survey made by the Institute of Biology, Mongolian Academy of Sciences in 2009, revealed 24,371. According to the result of this survey, the Siberian Ibex population has dramatically declined in Mongolia. The present estimate of 24,371 compared to the 80,000 in the "The Mongolian Red Data Book" in 1987 (Shagdarsuren et al. 1987).

1.4. Conservation Status

Globally, the Siberian ibex is listed as Least Concern in the IUCN Red List, as it is widely distributed and is believed to have large populations without any significant decline (Reading & Shank, 2008). In Afghanistan hunting has been banned by presidential decree, and the National Environmental Protection Agency banned hunting and trading of the Ajar valley population in 2009 (Large Herbivore Network, 2014). In Pakistan, ibex has been listed under Appendix III of CITES (Species+, 2014), and trophy hunting programs exist. In China, ibex was listed as a Class I species under the Wildlife Protection Law of 1988[1] (IUCN, 2014), which bans hunting or trade in the species without government permission, and only for approved purposes. In Kyrgyzstan and Tajikistan the species is found in many protected areas, with populations of several hundred in each. A limited trophy hunting program exists in both countries (IUCN, 2014). Populations also exist in protected areas in Russia and Kazakhstan, but their legal status outside of these areas could not be determined.

[1] Retrieved from http://www.china.org.cn/english/environment/34349.htm

In Mongolia, Siberian ibex are protected as “Rare” under the 2001 revision (Mongolian Government Act No. 264) of the 2000 Mongolian Law on Animals. This designation bans hunting except by permit for specific purposes. These purposes include research, cultural activities, controlling population size and disease, and sport hunting. Hunting quotas are set by the national government, and hunting permit fees are supposed to be based on the assessed economic and ecological value of the animal. Where they occur in strictly protected areas and national conservation parks, hunting is banned. They are also classified as Near Threatened under the most recent Mongolian Red List (Clark, et al., 2006).

2. Legal conservation status of the Siberian ibex (*Capra sibirica*, Pallas 1776) in Mongolia

Several different Mongolian laws come together to form the legal basis for conservation of wildlife in Mongolia. This document looks at the relevant parts of six Mongolian laws:

1. The 1994 Law on Special Protected Areas
2. The 1995 Law on Hunting Resource Use and Hunting and Trapping Permit Fees
3. The 2000 Law on Fauna
4. The 2000 Law on Hunting
5. The 2002 Law on the Regulation of International Trade in Endangered Animal and Plant Species (implementing CITES in Mongolia)

6. The 2004 Law on Environmental Protection

2.1. Mongolian Law on Fauna, 5 May 2000

The Law on Fauna, along with the Constitution of Mongolia, places ownership of all wildlife in the state (Article 10.1). Two categories of specifically protected wildlife species are defined: Very Rare and Rare:

- Very Rare wildlife "have a restricted capacity to recover, a limited distribution, no usable reserves, and are in danger of extinction" (Article 3.1.2). The list of Very Rare wildlife is included as part of the law (Article 7.1). Very Rare fauna may only be hunted or trapped for scientific purposes with authorization from the state, and all other hunting and uses are forbidden (Articles 7.2 and 7.3). Any proposed industrial or transport, construction occurring in the range of Very Rare fauna must first receive approval through an environmental impact assessment process (EIA) (Article 7.4).

- Rare wildlife "have a limited capacity to recover, limited distribution, have a small population, and are potentially in danger of extinction" (Article 3.1.3). The state determines what species to list as Rare (Article 7.6), and the Siberian ibex is included on this list (Clark, et al., 2006).

- Rare fauna may be hunted and trapped with a permit from the state for certain uses:

    - Scientific, research, cultural, artistic, and medicinal (Article 7.5.1)

    - After payment of special fees (trophy hunting) (Article 7.5.2)

- For regulating numbers and controlling infectious diseases (Article 7.5.3)

With permission from the state, fauna other than those listed as Very Rare may be trapped live for certain uses (Articles 11.1, 12), as long as they are not harmed, no health hazards are caused, and their habitat is not destroyed. These uses include the extraction of animal products, such as antlers, musk, wool, and others that do not require killing the animal (Articles 13 to 15).

The state is responsible for establishing hunting quotas, organizing scientific research, protecting territory, and managing game reserves (Article 6). People and organizations are responsible for protecting fauna during production and economic activities (Article 6.1.7). Persons or organizations that cause damage to fauna are liable to pay the government twice their assessed ecological and economic value (Article 25), and also face administrative penalties (Article 27). Repeat offenses, as well as hunting Very Rare fauna or causing other harm to them, bring criminal charges (Article 27.2).

2.2. Mongolian Law on Hunting, 5 May 2000

The Law on Hunting states that hunting management activities are necessary to determine population size and distribution and make sure that hunting is done sustainably (Articles 4.1 and 4.2). Hunting management is financed by the state, and is carried out by aimag and soum governments (Articles 4.4 and 4.5). They must carry out hunting management activities at least once every four years, and every year following commercial hunting operations (Article 4.4). It is illegal to hunt in an area where hunting management has not been carried out in accordance with this schedule, even if hunting that species elsewhere is legal (Article 15.1.2).

Three types of hunting are defined: commercial, household, and special (Article 6.2). The state sets maximum hunting quotas for each species by aimag (Article 8.1), and then each aimag can set their own quota equal to or smaller than the quota approved by the state (Article 8.2). Soum governments can enter into contracts with companies for commercial hunting, which specify the number of animals that may be hunted. Such companies must use professional hunters, and have and be able to implement a management plan to ensure sustainable use of the wildlife (Article 9). Mongolian citizens may hunt and trap non-rare animals with a permit (Article 10.1). The permit has a specific validity period (5 days for mammals, 3 days for birds and fish) and specifies how many individuals of a particular species may be hunted (Articles 10.3 and 10.4). Special permits are issued for hunting for sport, scientific, cultural, artistic, and medicinal purposes, and management of local populations (Article 11). Permits can also be issued to foreigners. Permits for hunting Rare Animals can only be issued by the state, while for other species they can be issued by soums (Article 11.1).

The law also forbids certain hunting methods and activities, such as chasing wildlife by vehicle or destroying dens (Articles 14 and 15). Hunting seasons are also defined (Article 13). Rangers are given certain powers to prevent illegal hunting and confiscate hunting-related property (Article 16.3). Administrative penalties are applied for violations (Article 16.1), and repeat offenses or illegally hunting rare animals can lead to criminal charges (Article 16.2).

2.3. Law of Mongolia on Environmental Protection, 30 March 1995 (Amended 22 January 1998 and 22 April 2002)

The Law on Environmental Protection contains broad measures to prevent damage to the Mongolian environment. Of most importance for ibex are: that natural resource use and permit fees must be based on an assessment of the ecological and economic value of the resource (Articles 8.3 and 8.4); that

commercial natural resource use requires EIAs and natural resource assessments (Article 7.2); that economic entities and organizations must monitor for harmful environmental effects and budget for environmental protection and restoration activities (Articles 25.1.2, 31.1.2, and 31.1.4); and that the government must carry out environmental monitoring and maintain a national database of monitoring reports, data, and statistics (Articles 10 and 12).

2.4. Law of Mongolia on Hunting Resource Use and Hunting and Trapping Permit Fees (19 May 1995)

This law specifies how hunting and trapping permit fees are determined, depending on who is doing the hunting and what purpose the hunting is for. There are both resource use charges, and permit fees (Article 2). Since the Siberian ibex is listed as Rare, only activities such as mentioned above are permitted. For scientific, cultural, artistic, and medicinal uses, for a Mongolian hunter, the charge is 20% to 40% of the animal's economic and ecological value (Article 5.1.2). For foreigners, it is equal to the international market value, or 60% to 70% of the economic and ecological value (Article 5.1.5). The permit fee is 20% to 40% of their economic and ecological value (Article 5.2.2). Exemptions exist, such as organized hunting to control populations or combat diseases, or live trap-and-release for scientific purposes such as attaching tracking collars (Article 6).

2.5. Law on the Regulation of International Trade in Endangered Animal and Plant Species, 7 November 2002

This law enshrines Mongolia's international obligations under CITES into national law. Commercial sale of Appendix I listed species and their derivatives is banned (Article 7.1), and sale of Appendix II listed species and their derivatives

requires a permit from the state (Article 7.3). It is required that legal trade will not threaten the survival of the species at present or in future (Article 7.4). However, the Siberian ibex is not presently listed under CITES (except under Appendix III by Pakistan, but this does not affect export from Mongolia) (Species+, 2014).

2.6. Mongolian Law on Special Protected Areas, 15 November 1994

This law defines four types of special protected areas (Article 3) and the activities that may be undertaken in them. The four types are:

1. Strictly Protected Area
2. National Conservation Park
3. Nature Reserve
4. Monument

All types of hunting, except for scientific research and maintaining population health, are banned in strictly protected areas and national conservation parks (Articles 12.1.3 and 18.1.1). Nature reserves allow traditional, sustainable, subsistence hunting (Article 21.1), and monuments only ban activities which would be detrimental to the historical or natural feature that the monument was created to protect (Article 24).

Strictly protected areas and natural conservation parks both have multiple use zones. In strictly protected areas, legal hunting activities are only permitted in the limited use zone (Article 11.1.4), and are banned in the conservation and pristine zones (Articles 9 and 10). The pristine zone allows essentially no human activity except for non-invasive scientific observation (Article 9). In national

conservation parks, legal hunting activities can be done in the limited use and travel and tourism zones, but not in the special zone (Articles 15 to 17).

2.7. Summary of laws concerning the Siberian Ibex in Mongolia

Based on the reviewed laws. The following points are important for the conservation of the Siberian ibex:

- Siberian ibex are listed as Rare by the government in Mongolia, meaning that they can only be hunted, with permission, from the state, for scientific, cultural, artistic, and medicinal purposes; or to control population size and health; or for trophy hunting.

- The state sets quotas for how many ibex may be hunted for various purposes, and is supposed to base fees on their economic and ecological value.

- The methods and times for hunting animals are restricted

- Where Siberian ibex occur within strictly protected areas and national conservation parks, they may only be hunted for research or population health, or not at all, depending upon the zone.

- Siberian ibex are not listed under CITES Appendix I or II, so no permits are required for international trade with them or their products from Mongolia.

3. Challenges of wildlife law implementation and enforcement

Mongolia faces significant challenges in implementing and enforcing its wildlife laws. The legal framework itself is relatively well developed, though it has a number of important flaws, and there is limited capacity to enforce it on Mongolia's vast ground (Wingard & Zahler, 2006). Broadly, there are three main challenges: divided management authority, lack of finances for monitoring and enforcement, and lack of enforcement capacity.

There are several major problems with how management powers are distributed in the Mongolian government. Most management activities take place on the ground, by the aimag and soum governments, based upon national policies. Wildlife utilisation quotas are set by the national government, but in a problematic way. The Institute of Biology in the Academy of Sciences is responsible for conducting wildlife surveys, and they then make a recommendation to the Ministry of the Environment and Green Development (MEGD) on the appropriate quota level. However, the Institute is under-funded and under-staffed. Scientists often have to rely on external grants for conducting research, and few biologists cover all mammal, bird, and fish species in Mongolia that can be hunted and fished. MEGD then sets the official quota. However, they can set it higher or lower than the proposal from the Institute, and lack the staff with expertise to assess the proposal and ensure that the final quota is scientifically based. Species listed as Rare under the Law on Fauna, which require a permit from the central government to hunt, and hunting activities for special purposes, have their quotas set by the Cabinet Ministry to guard against corruption, since this covers trophy hunting. However, the Cabinet Ministry also lacks the scientific expertise to properly set quotas. Quota setting for CITES-listed species is also flawed, and in in contradiction to the convention of the convention, as final decisions on disputes rest with the administrative body, not with the scientific body.

Wildlife management and conservation activities are severely underfunded in Mongolia. Fees for wildlife use and hunting permits are supposed to help finance conservation and management. However, the legal framework for distribution of

these fees is in some cases poorly designed, and in others simply not implemented, denying significant revenues to MNET and local governments, especially from trophy hunting permit sales. This translates into differences of millions of dollars. The largest challenge facing wildlife law in Mongolia is enforcement. Much enforcement activity falls to local governments, who lack the funding, staff, and training to properly enforce laws over vast areas of land. Single rangers may be responsible for patrolling thousands of square kilometers, and may have to have their own car and buy their own petrol. Staff responsible for border and airport security, who are important for halting illegal international trade, are similarly under-funded and under-trained. (Wingard & Zahler, 2006). Consequently, many people hunt without a license, as it is unlikely they will be caught (Pratt, Macmillan, & Gordon, 2004). Much of the wildlife trade takes place underground. A number of other issues also challenge wildlife law and policy in Mongolia. Many aspects of the legal regime are inflexible, preventing them from being easily adapted to meet changing environmental and economic conditions. For instance, species listed as Very Rare under the Law on Fauna are written directly into the federal statute, meaning new species can only be listed by the national legislature, making what should be a scientific decision a political one. Hunting and fishing seasons are also directly written into statutes, but these need to be able to be easily set by wildlife management officials to respond to conditions. Wildlife surveys are only mandated every four years, which is too infrequently for adequate adaptive management. Fees for violations of wildlife laws are also directly written into the statute, making many of them too low and ineffective at disincentivizing illegal behavior (Wingard & Zahler, 2006). Mongolia lacks an effective national pasture management framework, which has a significant impact on many species of wildlife that share forage, water and habitat with domestic livestock, such as argali, Siberian ibex, Asiatic wild ass, and wild Bactrian camel (Sheehy, Sheehy, Johnson, Damiran, & Fiamengo, 2010).

3.1. Social context and economic impact of the cashmere industry in Mongolia

Mongolia has long produced some of the finest cashmere in the world, due to its harsh, cold winters and large areas of rangeland. Cashmere comes from the inner hairs of the winter coat of goats, and the climate in Mongolia is ideal for making these hairs especially fine and soft. Cashmere quality is based on the diameter of the fibers (the thinner the fibers, the softer the resulting product); their length (long fibers make stronger textiles); their colour (white fibers can easily be dyed to other colours, while brown and grey are valuable for textiles with a natural appearance); crimp (how much the fibers curl; curlier fibers produce stronger textiles); and yield (the percentage of a given amount of raw cashmere that is actual cashmere fibers, rather than contaminants). Based on these criteria, Mongolian cashmere is superior to Chinese in certain factors (length and diameter), and much better than cashmere from other countries such as Iran and Afghanistan (Songwe & Magvan, 2003).

Mongolia has long been the world's second largest producer of Cashmere after China. China also dominates the manufacture of finished cashmere items, though important high-end brands are still located in Italy and the UK (Lecraw, Eddleston, & McMahon, 2005). The cashmere trade is an important contributor to the Mongolian economy, providing support to as much as a third of the population (Songwe & Magvan, 2003). In 2013, cashmere was the country's second largest export category after minerals, earning over 105 million US$, or 6% of exports. In 2013 cashmere exports were also 49% higher than in 2012 (Bank of Mongolia, 2013).

During the socialist period in Mongolia, herders had set quotas of raw cashmere that were supplied to state-controlled companies. Cashmere was exported from Mongolia, primarily to other countries in the Soviet sphere of influence, in various forms including finished products. One of the main cashmere companies in Mongolia, Gobi, was established as a state owned enterprise during that time.

After the end of the socialist system in 1990, the state-owned herds of goats were privatized through a voucher system. The economic collapse that followed the transition to democracy led many new herders to enter livestock raising, as they saw it as an easy way to make a livelihood (Songwe & Magvan, 2003). Without state controls on the number of livestock that could be privately owned, herds were rapidly expanded. Especially the number of goats in Mongolia went from 5 million in 1990 to 11 million in 1998 (Lecraw, Eddleston, & McMahon, 2005), and to over 19 million in 2013.

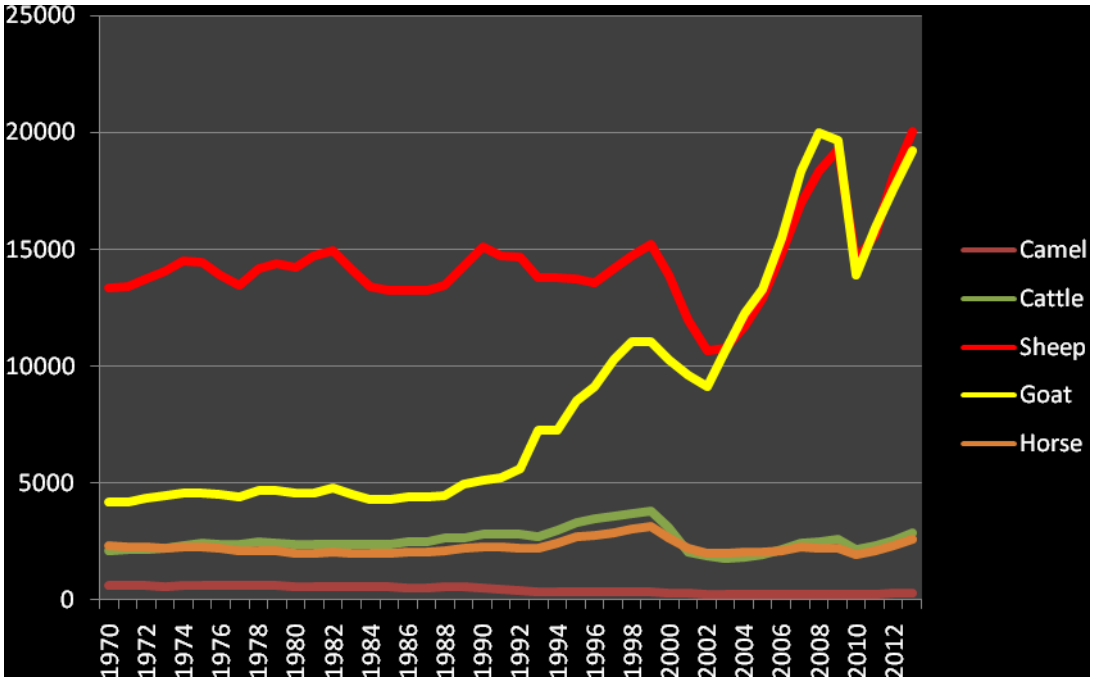

Figure 2-The trend in livestock numbers (*1000) from 1970 to 2013. Particularly important is the increased number of goats, influenced by the cashmere trade.

This growth can cause severe issues in the environment in terms of competition with wild species since goats can reach areas free from other livestock.

However, a number of economic factors conspired to reduce the competitiveness of the Mongolian cashmere industry, even as the amount of cashmere produced

soared. During the 1990s the government instituted a ban on the export of raw cashmere to encourage development of domestic processors and product makers to increase the portion of the value chain in Mongolia. This however only encouraged the development of the processing sector, allowing them to avoid the export ban by slightly upgrading the cashmere before exporting it, rather than keeping it in-country to produce finished products. It also led to cashmere traders not offering price differentials for cashmere quality. This, combined with a lack of knowledge and marketing skills among many herders, especially new entrants to the field, led to a decrease in cashmere quality as herders prioritized making more cashmere (Songwe & Magvan, 2003). A goat that produces higher quality cashmere also produces less, so if the price differential is not sufficiently high, production of high quality cashmere by herders is not incentivized, as was the case in Mongolia in the late 1990s (Lecraw, Eddleston, & McMahon, 2005).

The export ban was replaced with a 4000 tugrik/kg export tax on raw cashmere in 1997 when Mongolia joined the World Trade Organization. However, this tax, linked to weak government enforcement of border controls, led to rampant smuggling to China. Up to half of Mongolia's raw cashmere production was smuggled to China in 2004 (Lecraw, Eddleston, & McMahon, 2005). Chinese economic policies and conditions allowed Chinese traders to pay higher prices than Mongolian traders for raw cashmere while remaining profitable. Compared to China, Mongolia faced problems of high interest rates on loans, high cost of doing business due to taxes and wage levels, and expensive maintenance of equipment due to a lack of domestic manufacturers and mechanics.

During the early 2000s, the Mongolian cashmere industry was beset with a host of other problems. A lack of regulation of inputs to the cashmere industry, principally grazing land and water from wells, caused the livestock population to exceed the country's carrying capacity. This caused significant amounts of desertification and soil degradation. The industry itself was poorly structured. Livestock raising was seen as more of a traditional activity and safety net than industry, so public and

private sector institutions to support it had not been developed (Songwe & Magvan, 2003). The principal cashmere company in Mongolia, Gobi, was still partially government owned, which led to a skewing of policy in its favour, and was hemorrhaging money. Other companies were also performing poorly, and most were running well below capacity (Lecraw, Eddleston, & McMahon, 2005). Poor transport infrastructure made it difficult for herders to get their products to market, decreasing the prices they could command (Chimedtseren, 2006).

Since then, the situation seems to have improved, though no in-depth studies after 2005 are available. Gobi was fully privatized in 2007, and has since become the world's fifth largest cashmere company, exporting both processed cashmere and finished products, and selling to a large domestic market (World Intellectual Property Organization, n.d.). In 2013, the government approved $45 million US in loans to the cashmere industry to encourage its development to reduce economic reliance on the mining sector. These loans are expected to generate up to 30,000 jobs (Kohn, 2013). There have also been efforts to brand Mongolian cashmere abroad, including the creation of the Mongolian FiberMark Society in 2002 to certify the quality and origin of Mongolian cashmere products, as well the ethical and environmentally friendly nature of their manufacture (World Intellectual Property Organization, n.d.), and the launching of a government effort in 2011 to market Mongolian cashmere and leather in the high-end market (Kohn, 2013).

3.2. Wildlife use importance and trade, past and present

"Members of local communities, rely on the natural resources for their fodder, fuelwood, water, and food and thus exploit them without restraint" (Agrawal and Gibson, 1999).

Wildlife are intrinsic to everyday livelihood and household budgets of indigenous and local communities out of the urbanized system (Agrawal & Gibson,1999). These assumptions are the main points, which let us infer immediately, on the one side the importance of wildlife for local communities, on the other side the issues related to the conservation of the wildlife.

Since his existence, Homo sapiens has used wildlife to survive. Already, during the stone age, groups of hunters and gatherers had different land use patterns, depending on their ability to procure the food (Kusimba, 1999).

Throughout his history, *H. sapiens* influenced the biological community composition, sometimes causing the local or global extinction of one species, other times, increasing the biodiversity, as evidenced by the success of the of the intermediate disturbance hypothesis (Connell, 1978), in turn rooted in the model of Caswell (1978) of the non-equilibrium populations dynamic in a community.

In the last century the wildlife use for livelihood turned into trophy and commercial hunting. It caused the dramatic consequences for the biodiversity, especially when a species became a target for international interest. Nowadays, annual international wildlife trade is estimated to be worth billions of dollars and include hundreds of millions of plant and animal specimens. The trade is diverse, ranging from live animals and plants to the wildlife products derived from them. Environment and species with a low resilience are more susceptible to the exploitation. Particularly the last half century has seen the local and the global extinction of a big number of species, and the international trade has been one of the main drivers.

3.3. International trade regulation for a new challenge

Amongst the measures taken to regulate the international trade of wildlife species, the Washington Convention or The Convention on International Trade in Endangered Species of wild flora and fauna (CITES) is the most comprehensive regulatory instrument targeting wildlife trade across national borders (Phelps *et al.*, 2010).

The aim of CITES is to regulate and monitor the international trade in selected species of plants and animals by means of a permitting system and to ensure that international trade does not threaten their survival (www.cites.org).

A specimen of a CITES-listed species may be imported or exported (or re-exported) from a state party to the Convention only if the appropriate document has been obtained and presented for clearance at the port of entry or exit (www.cites.org). A state for which the Convention has entered into force is called a Party to CITES and, currently, there are 180 Parties (www.cites.org).

The Parties are responsible to regulate the trade of CITES-listed species in accordance with the restrictions and in compliance with the mechanism of the Convention. Mongolia is part of CITES since 1996 (even the regulation law was approved in 2002).

New forms of trade, often cannot be monitored so easily, as well as the illegal trade on the Internet. It is possible for a number of illegal wildlife and plant trade activities to operate. Web-related crime was discussed at the 12th UN Congress on Crime Prevention and Criminal Justice (Salvador, Brazil, 12-19 April 2010) and the Resolution adopted by the congress stated:

"We note that the development of information and communications technologies and the increasing use of the Internet create new opportunities for offenders and facilitate the growth of crime".

It can concern species already protected and others which are not.

With the growing number of traders and consumers, it is a challenge to categorize and enforce the wildlife-related legislation, and further instruments to monitor Internet trade are necessary (Salvador, Brazil, 12-19 April 2010).

Assessing the effectiveness of CITES compliance mechanisms are difficult (Marss, 2004; Reeve, 2006).

Over the last few years the CITES Secretariat has seriously considered the problems related to the monitoring of internet trade. The Secretariat, in August 2007 (Notification No 2007/026) specifically asked the Management Authorities of range states to provide, by December of the same year, information about:

a) *The scale and nature of wildlife trade conducted via the Internet that apparently involves their country;*

b) Any real or perceived problems relating to such trade, including illicit trade;

c) The nature and effectiveness of any measures that Parties have taken to regulate the trade in wildlife via the Internet, including the use of codes of conduct; and

d) Any changes in trade routes, species in trade and methods of shipment that have been observed as a result of increased use of the Internet to promote trade in wildlife.

In 2009, in Vancouver, the "Working Group on E-commerce of the Specimens of CITES-listed Species" was established (CITES, 2009a). The working group was formed with the purpose of finding out the trade trend over the web for CITES listed species and devising appropriate tools to tackle the illegal trade on the internet. However, subsequent research revealed several obstacles in tracking transactions actually carried out (UNEP-WCMC, 2009).

A market on the web surpassed every geographical barrier and escaped the control from the competent authorities, a high risk for those plants protected by the Convention. Particularly at risk are the derived part, which in some cases can be mailed by post and or mixed with look alike products, thus escape controls.

A study published in 2013 revealed that the internet plays an important role in CITES-listed species trade and most of this trade is carried out in the absence of CITES compliance and beyond the control of the competent authorities (Sajeva *et al*., 2013). It lets imagine that not protected species trade can be affected enormously by this system.

4. Siberian ibex current situation and aim of the survey

Over last two decades, the Siberian ibex wool, has been traded mainly in the European market, commercially known as "Yangir wool", from the Mongolian language. It is possible to verify, just typing "Yangir" on any research engine, to find the sales online. Manufacturers state that this wool is a side product of ibex hunting, i.e. that the wool is obtained from animals, which were shot for trophies. To obtain 1 kg of Ibex cashmere is required around 15 specimens (Tonin et al. 2002). Throughout the major Siberian Ibex population the number of issued legal hunting permits were found as few hundred that could not satisfy and meet the quantity of products on the market. It is hard to believe that the global market is powered from few tens of kg of wool (which only 10 kg should come from Mongolia) for annual consumption. From these assumptions, it was necessary, to aim this survey to the exploration of the current and past trade system of wild animals products and particularly about Siberian Ibex, in Mongolia.

Another important issue on which we focused in this research is the estimation of the other threats involving Siberian ibex. In fact, the illegal hunting may be one of the reasons influencing the Siberian ibex population decrease during the last two decades. Then, we tried to estimate the current hunting and household consumption of Siberian Ibex in Mongolia. Finally, the study tries to clarify the gaps between the national law and its implementation, identifying the cause of the poor implementation. Once identified the points mentioned above, this report aims to address the national authorities in adopting a policy for the Siberian Ibex conservation, as well as a strategy for the legal implementation.

4.1. Methodology adopted to investigate and collect data about Siberian ibex management, trade and threat

In the first part of the investigation, we focused on collecting data concerning the Siberian Ibex's past and current trade and hunting, including its management policy. We consulted the Ministry of Environment and Green Development of Mongolia in order to collect data about the laws regulating Siberian Ibex conservation and hunting permits issued. We obtained a list of the tourist companies who got permits to hunt (Annex II) and the number of permits issued in the last 10 years (updated until 2013).

A web survey was conducted during August 2013. Google was used as the search engine, and the following keywords were entered: "Yangir, Capra sibirica, Yangir wool, Capra sibirica wool, Yangir sales, and Capra sibirica sales",

The website address, brand/factory names, locations, prices and items (only when the price was specified per item, if you select the item) were recorded for each seller found.

Based on this information we planned the field survey illustrated in the following paragraph.

4.2. Market survey

Between March and May 2014, members of our team visited three of the main markets for animal product trade: Narantuul, better known as the Black Market, in Ulaanbaatar; Mercury, which is located close to the Ulaanbaatar train station; and Emeelt, which is located 45 kilometres to the west of Ulaanbaatar.

Each market was surveyed 8 times during the 12 weeks period.

Our investigators conducted observational surveys and randomly posed some question to the shop owners. When the questions concerned the Yangir's cashmere, the investigators just asked if there was any availability or where it can be found.

We avoided pretending to be interested in purchasing large volumes to avoid influencing the seller's answers.

The same protocol was adopted in the unique visit we made to the main raw material market of each province in our survey: Govi-Altai, Hovd, Bayan Olgii, Uvs, Zavhan and Arkhangai.

Figure 3- The signboard of a shop in Gov’-Altai raw material market

4.3. Face to face interviews

Between April and July 2014 (in two stages), we focused on collecting data from interviews concerning the past and current trade and hunting of the Siberian Ibex, in the species's major distribution area.

Figure 4- The Altai mountain, which are the main distribution area of Siberian ibex in Mongolia

The interviews with the local communities were done in six provinces: Govi-Altai, Hovd, Bayan Olgii, Uvs, Zavhan and Arkhangai. These provinces are located in central and western Mongolia, and host almost the entire Mongolian Siberian Ibex population. The following map shows the interview areas and the distribution of Siberian Ibex in Mongolia.

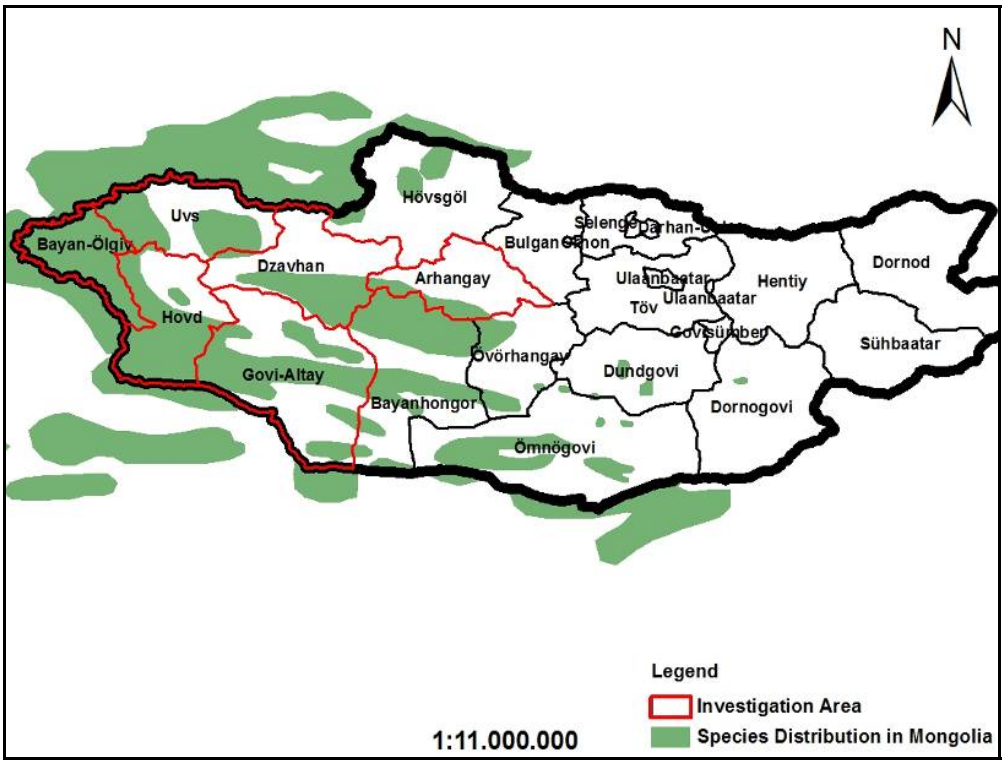

Figure 5- The shape files on spatial distribution of Siberian Ibex, have been kindly supplied by the IUCN Red List. Ref. IUCN (International Union for Conservation of Nature) 2008. Capra sibirica. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1.

The questions for the local community were developed to enable exploration of the current situation of Siberian Ibex conservation, illegal use and trade in Mongolia.

The questions for the local community were developed to enable exploration of the current situation of Siberian Ibex conservation, illegal use, and trade in Mongolia.

The questionnaire was developed on the basis of four main concerns:

1. Personal details of interviewees (name, age, profession, place of birth, residential status[2]).

2. Interviewee's knowledge about Siberian Ibex.

3. Interviewee's knowledge about hunting of Siberian Ibex.

4. Interviewee's knowledge about use of Siberian Ibex.

The table below shows the questions asked to the interviewees (*Note: In the interview, yangir refers to Siberian Ibex).*

Are you a fixed resident in this soum[3] or do you move by the season?
Do you know about Yangir? Does it occur in this area?
Do you know if yangir is hunted in this area?
Is yangir hunting common in this area (period, the number of specimens hunted)?
Is it hunted by foreigners or by local people?
In the last 10-20 years have you noticed an increase or decrease numbers of yangir?
Do you know what the use of the hunted specimens is?
Have you ever hunted yangir?

Table 1- Questionnaire used with local community people.

[2] Residential status criteria is unlike the concept of city or settled village address. This is to explore whether a person is from this specific area or moved in from outside that area.

[3] Soum is a smallest administrative unit as a sub-unit of province.

Each answer was catalogued in two or more categories established for each question.

Figure 6-A woman from Bayad ethnic group

4.4. Estimating the number of Siberian Ibex illegally hunted

Human population and age data were collected from the Mongolian Statistical Information Service and the CIA World Factbook. The percentage of males over 19 years old was calculated, as that is the average age for young men to start hunting alone. This percentage for each aimag was then calculated. The aimag population data are from 2013, while the sex ratio and age group percentages are from 2014. The lack of information of sex ratio and age classes for each aimag could cause some negative bias in the estimation. Other data, such as the number of illegal

hunters who hunt yangir and the average number of yangir hunted each year by each hunter, are derived from our survey.

$$Niu = \sum_{j=1}^{6} (Nj * [Nihs/Nms] * Ay)$$

Where: Niu = Number of illegal uses (meaning the number of yangir hunted illegally each year); j = Aimag (Province); Nj = Number of males over 19 years old, living in the Aimag j; Nihs = Number of illegal hunters surveyed (all were over 19); Nms = Number of males surveyed (all were over 19); Ay = Average of yangir hunted each year by each illegal hunter (three year basis).

5. Analysis of information and data, collected during the survey

5.1. Market survey

Compared to the previous situation described in "Silent steppe: the illegal wildlife trade crisis" (Wingard at al, 2006), today the situation of illegal wildlife trade in Mongolia has improved, at least in the internal market. During our market survey we found it difficult to find wildlife products, except for the species for which hunting is allowed and are commonly on sale, like wolf (*Canis lupus*), corsac fox (*Vulpes corsac*) and marmot (*Marmota sibirica*). It is possible to find oil from badger and very rarely from manul (*Otocolobus manul*), which according to the illegal traders are becoming very rare.

Nevertheless, our investigation was mainly focused on Siberian Ibex products, particularly its cashmere. Only two seller offered, respectively, meat and horns

(two pairs) from Ibex. They were in the Black Market in a hidden area. We did not find sellers who sell yangir cashmere. All of them knew that it is illegal.

Figure 7-A sheep fur used by seller to indicate their presence at the raw material market of Hovd city.

Some sheep fur placed on the side of the road indicates a cashmere seller. This method is the most widespread from the sellers in the raw material market.

Our investigation was extended to a limited number of cashmere agents (change) who confirmed the past international trade of yangir cashmere and that it is no longer possible because the species is listed as “rare” under Mongolian law. But when our team member pretended to be interested in buying a large quantity of yangir cashmere for a foreign company, one of the change showed interest in selling yangir cashmere, asking the quantity we needed and promising to provide it.

5.2. Siberian Ibex and online trade

In a short survey on yangir product online trade we found a wide offer of yangir product from different countries (Annex I).

Two websites offered bow and arrows, but the majority of sales products were items that derived from wool. There were ten different online shops offering products made of Yangir wool. Among the wool products, we found items like shawl, stole, coat and blanket. Prices depend on the size and weight of items that consumed large quantities of Yangir wool.

The more expensive items were made of 100% Yangir wool.

Figure 8-It is a coat 100% yangir wool, on sale for the collection 2013-2014.

In Table 1, the words in bold letters specified the three factories from England, Italy and France. These factories are found as suppliers to the others sellers in the Europeen Union and elswhere. Germany had the largest number of sellers, but all of them were supplied by one of the producers as revealed in the Annex 1.

This indicates that yangir cashmere is still widely traded outside of the species' distribution area.

5.3. Face to face interviews

A total of 104 persons were interviewed. The average age of the interviewees was 44,6 years old (min. 24, max 75). 42% of those interviewed were under 40 years old. 93,8% of those interviewed were male, and the remaining 6,2% were female. All the persons interviewed were fixed residents in the interview area and most of them move a few kilometers seasonally (1-3 km).

Figure 9 -Choikhand (left), the Director of Green Initiative, and Claudio Augugliaro (right), the Green Initiative Scientific Coordinator (next him our driver Naia), with a herder family in Hovd Province.

The number of interviews for each province was as follow: 20 in Govi-Altai, 21 in Hovd, 25 in Bayan Olgii, 6 in Uvs, 6 in Dzayhan and 26 in Arkhangai province[4].

All the persons interviewed were forthcoming in answering our questions. The result is displayed in the graph below.

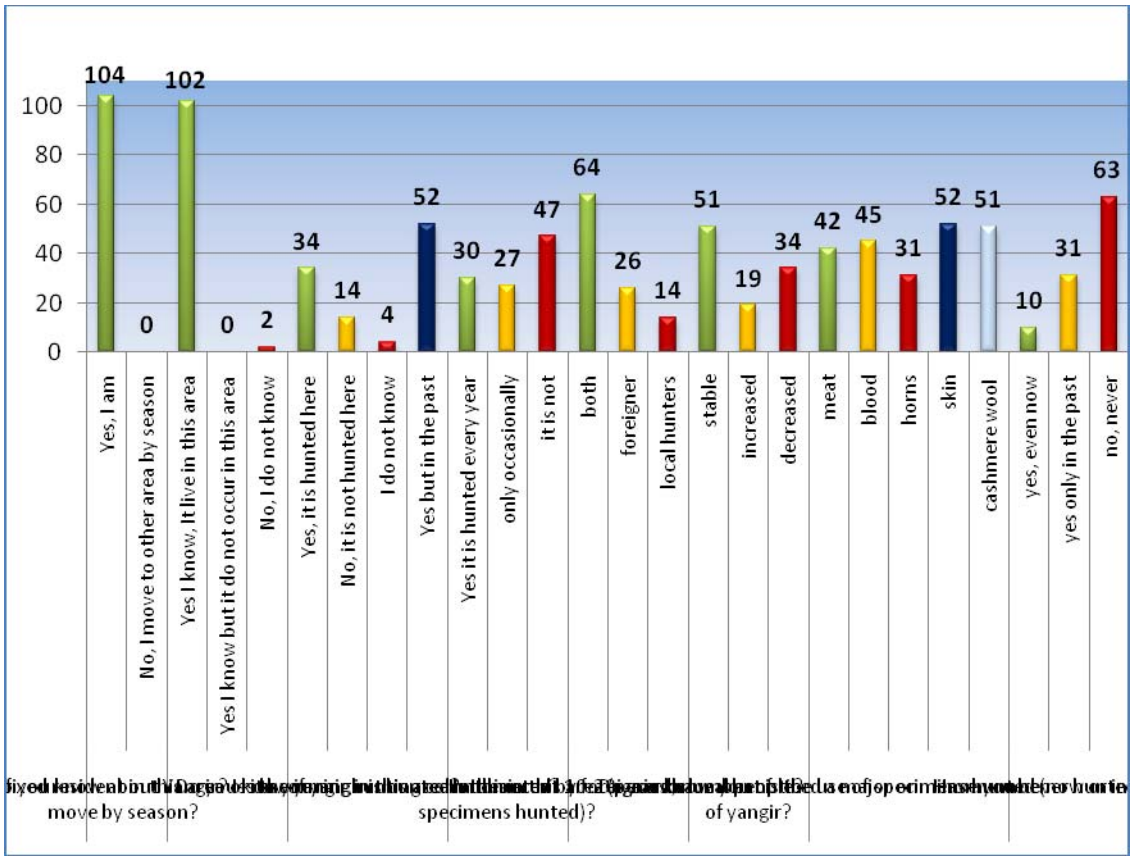

Figure 10- The graph resumes the answers of the people interviewed.

All the persons interviewed answered that they are fixed residents in the area and move only a few kilometers (1-5 km) twice a year. Everyone knows about Siberian Ibex and 102/104 answered that they have seen it often during their life.

[4] Province is an administrative unit. Mongolia has 21 provinces.

Around 35% of the interviewees responded that ibex hunting is occurring in their area today as well as in the past. Half of the interviewees answered that hunting was common only in the past and the remaining deny that hunting occurs in the area (even in the past) or cannot answer because they do not know. Everyone was aware that Mongolian law does not allow ibex hunting, except for a limited number for tour companies. Among the interviewees 30/104 answered that yangir hunting is common in the area.

They also gave some information about the hunting period and the number of specimens potentially hunted. Generally, the right period for hunting is October, during the rutting-estrus period. In certain cases, it could be hunted during the early spring for the purpose of making a warm coat, as ibex fur is thicker at that time.

The hunters who admitted that they hunt illegally were 10 in total in the six provinces surveyed. Some of them declared that they hunt at least one specimen of yangir every year. In some cases the hunters used to hunt together and in some cases they said they do not hunt the yangir every year. The average number of yangir hunted, considering the facts mentioned above, ranges from 0,3 to 0,67 yangir per year per each hunter, depending from the province. The local environment officers confiscated from poachers only a few specimens per year (1-3).

From the response, it was found that both the local population and foreigners continue hunting yangir in central and western Mongolia.

There is discordance regarding the population trend. The majority of the interviewees expressed their opinion that the population was stable over the last 20 years. The answers were influenced by the age of the interviewees, since a large majority of under 40 respondents answered that the yangir population is stable. The next largest part of the interviewees (32,7%) stated that the ibex population

has decreased and the rest (18,3%) of them think that the ibex population has increased in the last 20 years.

This discrepancy may due to the differences between Ibex populations which occur inside the protected area and those which live outside. All the interviewees over 45 recognized that in the past yangir populations, as well as those of other ungulates and in general of all wildlife, have declined seriously.

86 of the 104 interviewees responded about the use of yangir. They answered that there are multiple common uses for Siberian Ibex in Mongolia. The uses mentioned are meat, blood, horns, and skin. 49% of the interviewees answered that they know about the brushing of cashmere from the ibex, but this was only done in the past.

Of the 104 interviewees, 97 were male and all of them were over 23 years old. The majority of the hunters who hunt illegally were found in Arkhangai province where we conducted more interviews than in other provinces. From our estimation the total number of Siberian ibex illegally hunted is 4526 individuals per year. This is a very large number in a population that in 2009 was estimated to be 24,371 specimens.

6. Consideration about the general issues involving the wildlife management with particular focus on Siberian ibex

6.1. General issues

As mentioned, the general situation of illegal wildlife trade seems improved in recent years. The market chain for the target species of hunting follows the same system: local people sell products for a few dollars to traders, which will be sold at a much higher price in the markets.

Figure 11-Two Corsac (Vulpes corsac) during the drying process, hunted by local herder.

Due to the huge territory, the lack of paved roads, and mainly to the small number of inhabitants, checking for illegal hunting is almost impossible for local authorities. Public institutions, especially at the soum level, lack qualified staff and the number of biologists/ecologists involved is too low for territories with areas often over 75000 km^2. Each Province of this size has only a few employees at the provincial environment office, and two or three persons are active in each soum (the average is about 15 soums per province).

Furthermore, the environmental laws have some gaps and do not fit with the territories' needs.

For example, we recorded the highest number of illegal hunting in Arkhangai.

Figure 12- Wonderful landscape in Arkhangai province.

We recorded the highest level of illegal hunting in Arkhangai. This could be due to the fact that Arkhangai is a forested area, where there has been a significant application of the revised Mongolian law on forest (Government Bulletin, 2012, No. 22) and its forest management framework. We have not yet studied the Mongolian Law on Forest in depth, and here we will report **only** the perspectives of local people. They described to us that the law establishes that local people must manage and use local forest resources, but that mismanagement is common. They said that since the law does not specify any criteria for environmental monitoring and that there is not a specific requirement to ensure a sustainable use of forest resources, local people organized very closed and authoritarian groups which do not have the competence to conduct environmental monitoring and management,

and they have full control of their area. The result is environmental degradation and impoverishment (and private agreements between local herders and wood companies or others, often foreigners). Even the hunters who declared that sometimes they hunt illegally complained of this unsustainable situation, and of very “sadistic” practices used on new-born wild animals, to track and hunt them once they become adults (including carnivores such as wolves and threatened species such as the Siberian musk deer).

The impression is that the situation of hidden hunting and probably trade is still delicate and may be worsening.

6.2. Siberian ibex issues

During the last decade yangir (*Capra sibirica*) has been commercially traded in the global market. Its sale is still very widespread on the Internet. Bow, arrows, and wool are sold in markets and such items also can be found on the Internet.

It was necessary to conduct an investigation in order to understand what is going on and how the Siberian ibex are or have been supplied to the market.

In Mongolia the Siberian Ibex was listed on the rare species list in 1995. The rare species list later was approved by the Government Resolution No.264 in 2001. The use of rare species is regulated by the relevant government authorities in Mongolia.

According to the Article 175 of the Criminal Code of Mongolia, rare species and their products transferred and transported will be considered as illegal. A person who carries items from rare species will be charged for criminal activity. Under the Mongolian Law on Fauna and Law on Hunting, the hunting of rare species requires a special permit issued by the government.

Poaching has likely been reduced during recent years, but it still occurs and it is not very easy to determine the volume since recently local herders are aware about the hunting law and penalty fee for illegal hunting, which makes them afraid to admit poaching.

Another threat widespread in the last 7 to 8 years is an epidemic affecting the Altai ibex population, reported by the directors of environmental offices in Hovd province. According to them the ibex population is being affected by *Sarcoptes scabiei*, and animals are found sick or dead.

Figure 13- An environment officer of Hovd Province with a Siberian Ibex foud dead affected by scabies according to his diagnosis.

They said that the Ministry of Environment did not give enough assistance to solve the problem and in the province there a lack of skill and funds to confront

the issue. Local hunters suggested shooting into the air, making the ibex run and sweat to help combat the disease (this is a very common idea among hunters; in their opinion shooting helps the population's health and fitness). Nevertheless they exclude shooting in protected areas. The local herders continuously ask for help from the local environment office because their livestock is often infected by scabies. It is difficult to estimate the size of the problem, but it may influence Siberian ibex mortality, and it is still unknown what the effect on Ibex predators like snow leopard may be, since some transmission to other predators species in other parts of the world has been found (Pence at al. 2002). Green Initiative NGO started an intensive contact with the Hovd environment office and asked for a comprehensive report to examine the past and current situation.

6.3. Final considerations

Based on the data we collected, several possible hypotheses emerged to explain the current international trade of yangir products.

Woollen mill companies, which are selling products made of yangir cashmere, may still be using a stock of wool collected before the trade was restricted.

Dr. Tonin, who analyzed a huge stock (1000 kg) of Asiatic Ibex cashmere that arrived in Europe in 2002, said it was probably collected from various countries in central Asia. It is possible that in socialist and post-socialist times wool was collected among the countries under Russian influence. From our investigation it is possible to assume that in the past there was a collection of yangir cashmere in Mongolia, probably sent to the Ulaanbaatar markets and later to international trade (as confirmed by the environment officer who organized the official hunting, which was also for meat, at the end of 1990s). Since socio-economic conditions have changed since the 1990s, agents were replaced by the

"Change"[5] and they continued the cashmere trade. Local herders told us that change can easily recognize the yangir's cashmere by touching it.

The environment directors of the provinces where the investigation took place said that until the second half of the 1990s, hunting of hundreds of yangir was authorized and the local government organized official hunting. This was to provide food for the army and secondary schools. The skin with wool and skulls were sent directly to Ulaanbaatar.

Both local herders and environment officers mentioned hybridization between Siberian ibex and domestic goats, though it is not very widespread. Its purpose is to improve the quality of cashmere in Mongolia.

From our investigation, it seems that the trade in yangir cashmere from Mongolia has stopped. In our investigation, we saw how only older herders (over 45) know about yangir cashmere use and trade, while all the under 40 herders do not know about it (except a very few interviewees). Likely, the stock in Europe was large enough to satisfy the small niche market for these new and expensive products.

From this survey, we assumed that international trade of yangir cashmere probably involved several countries, including Mongolia, during socialist and post-socialist times. Today, this trade is not significant. However, the availability of traders who are willing to sell it, as we verified, could mean that once the international stock of yangir cashmere is finished, the trade could be resumed. The products made of yangir cashmere are still offered online by European brands in the new collection for 2013-2014.

[5] Change is a commercial agent and middleman between herders and foreigners, factories etc.

Although the international trade of Siberian ibex cashmere and the threat it poses is temporary suspended, the illegal hunting by local hunters can be a serious threat to the species. We estimate that **4526** specimens are hunted in the main distribution area of the Mongolian Ibex population each year. Of course, this estimation is susceptible to some bias. For instance, since we were interested in interviewing hunters, sometimes we found them by the suggestions of neighbouring families (6-7% of the hunters interviewed). This could cause a slight overestimation due to the higher number of hunters interviewed compared to their percentage of the total population. On the other hand, the majority of the interviewees (around 70%) admitted that they still regularly hunt Siberian Ibex. The local people who confess the hunting were the people who know the interviewer well and collaborate with our NGO. This could mean an underestimation due to the fact that unknown hunters could be afraid to reveal their crime to a stranger, especially to an NGO worker. We reasonably concluded that the number of Siberian ibex illegally hunted has a higher chance to be underestimated or at least reliable (as suggested by the answers of the majority of the hunters who declared that they hunt only legally).

In conclusion, herders and local environmental officers reported a decrease in yangir population compared to the past, which can be validated by the population survey results of the Institute of Biology, Mongolian Academy of Sciences, in 2009. According to the result of this survey, the Siberian Ibex population has dramatically declined in Mongolia. The estimate of the ibex population was 24,371, compared to the 80,000 estimates from "The Mongolian Red Data Book" in 1987 (Shagdarsuren et al. 1987).

As we reported, multiple reasons are likely, from yangir cashmere trade in the recent past to ongoing illegal hunting for local consumption to local scabies epidemics that may still be undetected.

This makes necessary monitoring of the population and the epidemic, as well as the monitoring of products made from yangir cashmere offered online, in order to understand if international trade from Siberian ibex range countries will occur in the future.

The main problem that Mongolia faces today is the enforcement of the environmental laws. Human population density is very low (i.e. 0,41 people/km^2 in the Govi-Altai) and consequently the number of people involved in environmental work is very small. The qualification and expertise of the people involved in administration/management is often too low, and not suitable to make sound decisions on environmental protection. Very often new graduates in ecology or biology do not even know about "binomial nomenclature", especially those from private universities, and they return to their soum and become responsible for environmental affairs without any further training and qualification. The main problem is the centralized system of environmental management. Few public institutions and few people have the power to take the range of action necessary for safeguarding the environment over Mongolia's vast territory.

The best experiences with environmental management in Mongolia are from NGO or model ecosystem management programs, such as those at Khustai National Park and Ikh Nart Natural Reserve.

A model ecosystem management program, using expertise from government and non-government organizations, is the best solution. Criteria to measure the qualifications of NGOs and their personnel are necessary, based on the value of the publication in international scientific journals and others, to measure the qualification for the NGOs and their members (something almost unknown in Mongolia if out of the Academy of Science at present), with the purpose to improve the management at soum level.

In summary, in our survey and research we investigated:

- the international trade of yangir cashmere, its current situation and the potential future changes;

- the high level of illegal hunting of Siberian ibex;

- the natural threat of the scabies epidemic, which is worthy of further investigation.

For these and other environmental issues, we strongly encourage the national authorities to favour a “model ecosystem management program” at the soum level. It will be successful if implemented at the soum level, by NGOs and government organizations, which have at least some expertise and well-qualified personnel to plan and manage the program. It is the only solution that will enable a capillary, constant, and earnest management of the country’s environment.

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7.Annex-1

List of Yangir items offered online and their sellers/producers (August 2013)

Item	Price in euro	Brand/Factory	Location	Website
Shawl and stole	1074	Brun de Vian-Tiran	France	http://www.brundeviantiran.com/en/natural-fibres.cfm?i_fib=33-Yangir-blanket-shawl
Shawl and stole		Scabal	UK	http://www.scabal.com/sbnames.php?category=special&id=120
Shawl and stole		Matthias Aull	Germany	http://aull.de/Yangir
Coat		Colombo Textile Company	Italy	https://www.lanificiocolombo.it/Azienda/FibreNobili_it.html
Blanket	2693	Casa e Natura	Italy	http://www.lacasaeconaturale.it/promozioni/416-piumini-trapunte-coperte
Various		elegantline	US	http://www.elegantlinenspc.com/Wool-Blankets.htm
Stole	360	cashmereblues	Germany	http://cashmereblues.com/catalog12/
Blanket		sweet-dreams-collection-sa	France	http://www.sweet-dreams-collection-sa-francais.com/
Various		willemsen-duesseldorf	Germany	http://www.willemsen-duesseldorf.de/exklusive-fasern/Yangir/Yangir.html
Various		Tobias Patitz	Germany	http://www.tobiaspatitz.com/seiten/black-label/06-Yangir.html
Bow and arrows	390	e-mongol.com	Mongolia	http://www.shop-e-mongol.com/en/arrows-mens-size-han0801081-xml-267-1761.html
Bow and arrows		exodeco		http://www.exodeco.com/en/articles-deco.php?catnom=tools&locnom=mongolia&cat=25&loc=431

8.Annex-2

List of companies that got the permits to hunt Siberian Ibex in Mongolia in 2006-2012

Companies which obtained the hunting permit in 2006-2012	
1	"Монгол сафари" ХХК
2	"Монгол тур" ХХК
3	"Женесис" ХХК
4	"Нью тур" ХХК
5	"Алхана трэйд" ХХК
6	"Аттон-аммон" ХХК
7	"Эдельвайс" ХХК
8	"Санни Гоби Тур" ХХК
9	"Адьяа энд алтай" ХХК
10	"Монгол хаан трэвэль" ХХК
11	"МАТ" ХХК
12	"Нью жуулчин турс" ХХК
13	"Монгол райзен" ХХК
14	"Монголиан Оутфиттерс Консерциум" ХХК
15	"Монгол хантинг энд турс" ХХК
16	"Зэрэглээт" ХХК
17	"Түвшинтоур" ХХК
18	"Эрүүл интернэшнл" ХХК
19	"Agula tour" Co.,Ltd
20	"Тийн магнер трэвел" ХХК
21	"Жуулчин говь" ХХК
22	"Солонга лайн" ХХК
23	"Чингэс лэнд тур" ХХК
24	"Монгол Алтай травел" ХХК
25	"Гүрү" ХХК
26	"Планет интернэшнл" ХХК
27	"Amazing steppes" Co., Ltd
28	"Зэрэглээ" ХХК
29	"Яагд энд тур" ХХК
30	"Look mongolia" Co., Ltd
31	"Хан Сол" ХХК
32	"Газар Эко" ХХК
33	"Хүрэн булаг" ХХК
34	"Ар монгол трэвл" ХХК
35	"Хаан ус" ХХК
36	"Сайхан сэтгэл" ХХК
37	"Ариун цэн" ХХК
38	"МБМХ" ХХК
39	"Сэлэнгэ сутай" ХХК
40	"Холистик" ХХК
41	"Тулга импорт" ХХК
42	"Ихрэс" ХХК
43	"НБ Интернейншл" ХХК
44	"Эко ертөнц" ХХК
45	"Нар туг" ХХК
46	"Дархан-Өргөө" ХХК
47	"Хархорин" ХХК
48	"Мэргэнван" ХХК
49	"Хоёр загал жуулчин" ХХК
50	"Монгол шинэ тив" ХХК