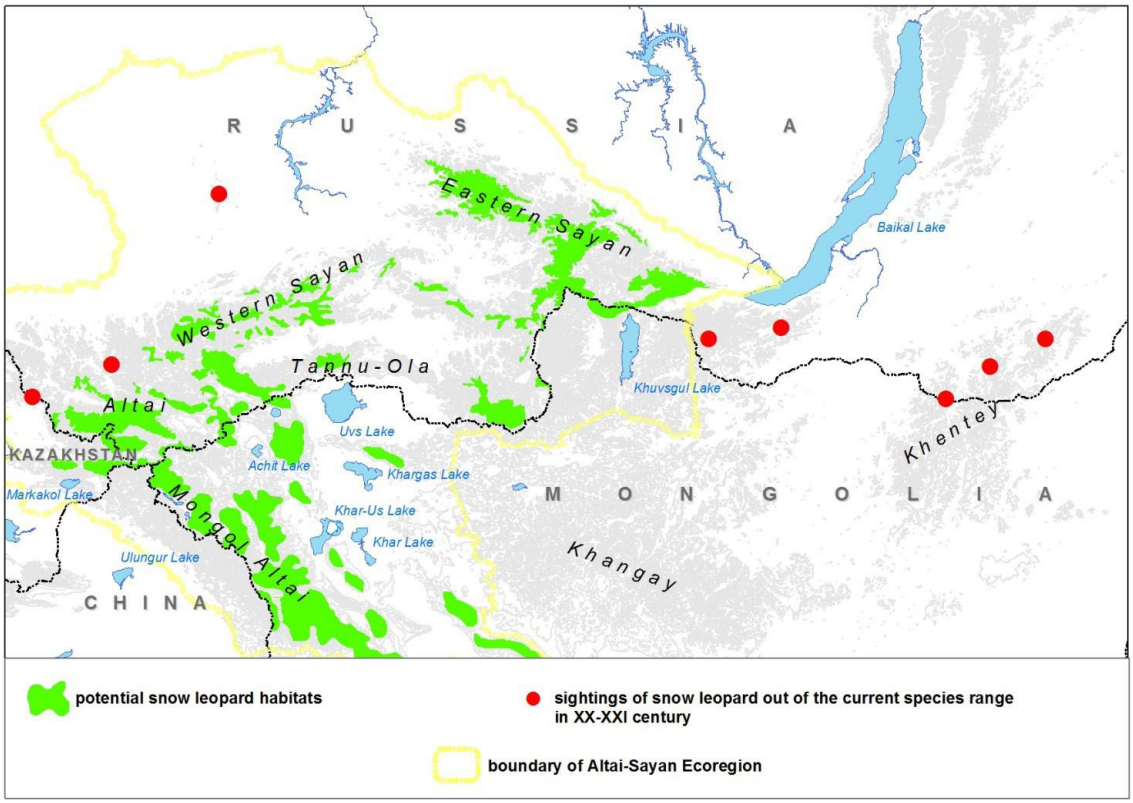
Russian Federation

Executive Summary

In Russia the snow leopard is at the northern edge of its modern range and has only a few sustainable populations of animals in optimal habitat areas – the mountains of the Altai-SayanEcoregion. Russia's population of snow leopards comprises just 1-2% of the total species population. The total area of potential snow leopard habitat in Russia is approximately 60,000 km^2 (Map1).

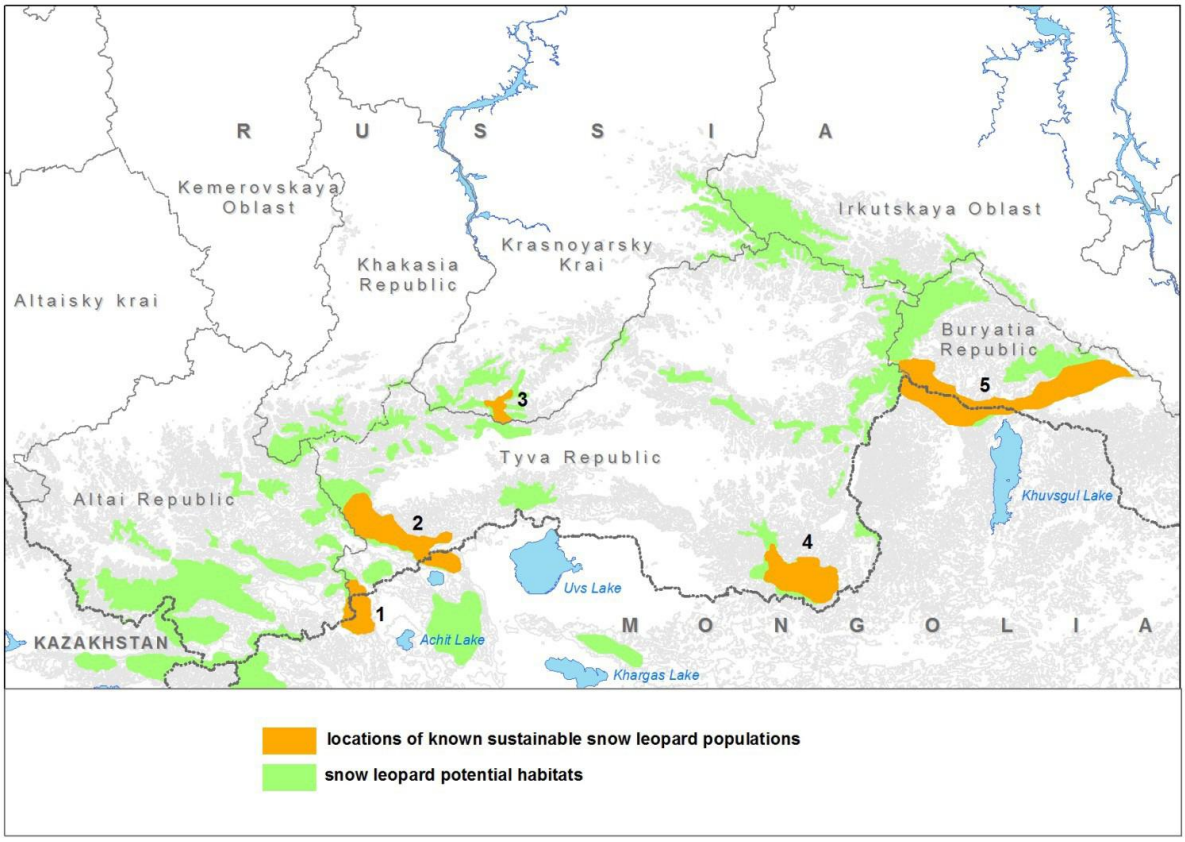
Map 1. Potential snow leopard habitat in Russia and in adjoining areas of Mongolia, China, and Kazakhstan (Strategy for Snow Leopard Conservation in Russia, 2002; Munkhtsog (unpublished) and our additions)



However, the areas regularly inhabited (no or little snow cover in winter months and adequate prey species populations) by snow leopards are much smaller, do not exceed 20,000-30,000 km^2, and are home to, in all probability, no more than 70-90 snow leopards. The habitat area for known stable populations of snow leopards in Russia is no more than 12,000 km^2, and that area is home to no more than 50-65 snow leopards (Map 2).

Snow leopard survival in Russia depends to a significant degree on the preservation of spatial and genetic connections between Russian populations and the main population nucleus in western Mongolia and perhaps northwestern China. As in the other countries in its modern range, the main threats to snow leopards in Russia are deaths caused by poachers and herders, loss of prey base, and in some cases, loss of habitat related to the development of mining and transportation infrastructure. Snow leopard body parts are often used in traditional eastern medicine as a substitute for tiger parts, and the animal's fur is of great value for luxury seekers. The significant popularity of snow leopard products in illegal trade is a serious concern for the species' future. The preservation of this northernmost population of snow leopards living in Russia – animals that are well adapted to hostile environmental factors at the edge of the species' range – is an important component of efforts to protect this species and its genetic diversity in Central Asia.

Map 2. Locations of known snow leopard populations in Russia



1 — Chikhachev Ridge

2 — Tsagan-Shibetu Ridge, southern part of Shapshal Ridge and western part of Western Tannu-Ola Ridge

3 — Sayano-Shushensky Nature Reserve and its buffer zone

4 — Sengelen Ridge

5 — Okinsky and Tunkinsky Ridges

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Valuing the snow leopard ecosystem and its economic, biodiversity, and spiritual/cultural services to the community, to the nation, and to the planet

The habitats of snow leopard in South Siberia represent a set of different ecosystems in the elevation range from 540 and 4000 m above sea level. As a rule, optimal snow leopard habitat in the Russian part of the range is high-relief mountains with clearly defined rocky ridges and deep gorges, cliff massifs, and steep boulder fields. All good snow leopard habitats are distinguished by the absence or minimal presence of snow cover during the winter months. Such habitat is advantageous for Siberian ibex as well as other ungulates – the snow leopard's main prey. In addition to traversing open slopes, snow leopards pass through islands of forest cover.

Potential snow leopard habitats in Russia take about 60,000 sq. km of mountain ranges in South Siberia. The snow leopard is at the top of the ecological pyramid in South Siberia and Central Asia's mountain ecosystem. For this reason, sustainable populations of snow leopard are directly connected to the conservation of mountain-steppe, mountain-tundra and mountain-forest-steppe biomes, areas that have been inhabited by humans since ancient times and that are vital to the survival of South Siberia's nomadic peoples.

Optimal snow leopard habitat is also well suited for pasturing livestock, a fact that often results in conflicts between herders and this predator. In the best habitats, snow leopards form sustainable populations whose presence can be readily determined by noticeable evidence of marking activity. In the Russian portion of the range, such habitats are quite limited and comprise no more than 10-20% of the total potential habitat for this species. The irregular character of this habitat distribution determines the island-like nature of Russia's snow leopard population.

Until now general part of snow leopard habitats in Siberia is used **as traditional pastures for livestock and hunting areas of indigenous people.** These **highlands are also homes for valuable medicine plants and mountain ungulates** (popular game species). **Glaciers play important role in regional climate regulation** and water balance of mountain rivers (upper reaches of great Siberian Rivers like Ob and Yenisei). Also **snow leopard habitats represent excellent recreation areas and potential for tourism development,** including ecotourism, rafting, trekking, horse riding and climbing. For many Asian peoples **the snow leopard is a symbol of strength, nobility, and power**. Its image can be seen on the coats of arms of a number of different Siberian and Central Asian cities.

Table 1 below describes the biodiversity and economic values of snow leopard habitats in Russia.

Table 1.Biodiversity and economic values of snow leopard habitats in Russia

Value	Approximate assessment
1. BIODIVERSITY AND ECOSYSTEMS	
1. Number of vascular plant species	About 2000
2. Number of vertebrate animal species	About 500
3. Number of endangered species of plant and animals	About 100
4. Total number of wild ungulates	15,000-20,000
5. Water supply in glaciers	About 40 cubic km
6. Water supply in mountain rivers and lakes	About 150 cubic km
B. ECONOMIC	
1. Number of people living in the snow leopard habitats and around them	About 300,000 (95% of them are indigenous people)
2. Total number of livestock	About 200,000
3. Total area of mountain pastures	About 40,000 sq.km
4. Annual number of tourists	About 1,000,000
5. Total supply of game resources	????
6. Total supply of medicine herbs	50,000-80,000 tons
7. Total potential for hydropower	About 150,000 billion Kwt/hours
8. Total supply of mineral deposits	????

Disseminating information on the value of the snow leopard ecosystem and generating support for conservation

Past efforts

Educating Russians about the status of snow leopards as a national asset and unique animal of global importance and the importance of consciously biding by recommendations and limitations and encouraging individuals to get personally involved in conservation activities are of the utmost important for snow leopard conservation in Russia.

Effective public outreach can be assessed by measuring public opinion on snow leopard conservation and a willingness to support such activities. Results such as reduced snow leopard poaching, growth in the number of people involved in volunteer conservation activities, public support for protected areas, and improved compliance with limitations on resource use affecting snow leopards all are a testament to effective public outreach.

To disseminate information on the value of the snow leopard and its habitats in Russia following means were used in 1998-2012:

Publications

- Conservation Strategy for Snow Leopard in Russia (2002)http://wwf.ru/resources/publ/book/eng/7
- Conservation of Snow Leopard in Russia (2012) http://wwf.ru/resources/publ/book/eng/599
- **Assessment Report: Climate change and its impact on ecosystems, population and economy of the Russian portion of the Altai-Sayan Ecoregion (2011). Moscow: WWF-Russia** http://wwf.ru/resources/publ/book/eng/486
- Protection of livestock corrals from snow leopard. Manual for herders in Tuva Republic. UNDP-GEF Project (2008)
- Using electric fences to protect livestock from snow leopard. Manual for herders in Tuva Republic (2009) http://www.altai-sayan.com/about/publ/izgorodi.pdf
- WWF Altai-Sayan Bulletin
- Book of Meindert Brouwer (editor) “The Ecosystem Promise” (2012)http://www.ecosystempromise.net/
- Press-releases in Mass Media and web-sites of Russian organizations:
- WWFwww.wwf.ru(at least 30 press-releases per year)
- UNDP-GEF Project “Biodiversity Conservation in the Russian Portion of Altai-Sayan Ecoregion” http://altai-sayan.com/(already closed)
- Russian Geographic Society http://int.rgo.ru/
- Russian Academy of Science http://www.sevin.ru/
- http://www.sevin-expedition.ru/
- Federal Mass Media: at least 3 articles in printed media per year http://expert.ru/siberia/2003/05/05si-ipovest5_68986/; at least 1-2 TV shotsper year http://www.1tv.ru/news/social/192622; at least 50 news on web-portals per yearhttp://ria.ru/eco/20130128/920115080.html)
- Regional mass media: at least 1-2 articles in printed media per monthhttp://zvezdaltaya.ru/novosti/v-ongudayskom-rayone-otmetili-den-snezhnogo-barsa-07-08-2012.html; at least 1 TV-shot per 1-2 monthshttp://www.elaltay.ru/index.php?option=com_content&view=article&id=300:2012-09-17-12-15-28&catid=34:gtrk-gorny-altay-novosti-dnja-kat; at least 15 news on web portals per month http://www.gorno-altaisk.info/?s=%D1%81%D0%BD%D0%B5%D0%B6%D0%BD%D1%8B%D0%B9+%D0%B1%D0%B0%D1%80%D1%81&x=0&y=0
- Ministry of Nature Resources of Russiahttp://www.mnr.gov.ru/

Projects and Public Events:

- Land of Snow Leopard Festival in Altai Republichttp://wwf.ru/resources/news/article/9977; http://wwf.ru/resources/news/article/10148
- Land of Snow Leopard Festival in Tyva Republichttp://wwf.ru/resources/news/article/9533 ; http://wwf.ru/resources/news/article/9776
- Land of Snow Leopard Homestay Program. WWF and CITI Foundation 2011-2012http://wwf.ru/resources/news/article/9098
- Land of Snow Leopard Ecotourist Route. WWF and UNDP/GEF Project http://wwf.ru/resources/news/article/7196
- TosErtine (Nine treasures of Tuva): Snow Leopard is Tuvian treasure Number 1 http://wwf.ru/resources/news/article/6638
- TuvianKamby-Lama helps to save snow leopardshttp://wwf.ru/resources/news/article/5070

Future possibilities

Effective long-term snow leopard conservation in Russia requires the following strategies:

A. Encourage people living within the snow leopard's range in Altai,Tuva and Buryatia Republics, as well as in southern Krasnoyarsk Krai to relate to the cat as a part of their natural and cultural heritage and to understand the necessity of its preservation as ecological, economic and cultural value. It could be done in several ways:

- work with regional media to ensure regular coverage in the local press about the value and importance of snow leopard conservation;
- develop and implement targeted information campaigns with the goal of establishing a positive image of the animal as a symbol of Altai and Sayan. One such campaign could be the annual Snow Leopard Day festival, organized with support from WWF in Altai and Tuva Republics;
- active engagement of Buddhist leaders and other respected public figures in snow leopard conservation outreach among local residents;
- Engage local people in monitoring and conservation of snow leopard populations through economic incentives, such as ecotourism and souvenir production development in snow leopard habitats, and development of mutual cooperation between local communities and private and corporate donors for snow leopard protection.

B. Facilitate increased professional expertise among decision-makers and resource management experts for sustainable use of snow leopard habitats as important resource for recreational activities, livestock grazing and wildlife management. It can be done through development of special courses and programs for managers and decision-makers at national universities.

C. Facilitate nationwide public understanding of the need to conserve and sustainably use mountain ecosystems for snow leopard conservation as well as the leading role of protected areas in protecting this and other unique species and creating societal intolerance for poaching. This strategy can be implemented via national TV campaigns for fair hunting, ecological tourism and support of Protected Areas, as well as via popularization of recent scientific research on snow leopard *eco*logy.

D. carrying out of scientific researches with the use of modern methods of analysis such as molecular-genetic, physiological status, tagging satellite transmitters, modeling of habitats with use of GIS technologies, automatic came traps, the study of disease etc.

Assessing threats, both traditional and the new ones from infrastructure development, market demand, tourism, and climate change to snow leopard and its habitats

A variety of natural and anthropogenic factors influence the condition of snow leopard populations. Limiting factors that influence snow leopards can be divided into 2 main groups: direct and indirect impacts (Map 3 and the Table 2).

Table 2.Key threats for snow leopard in Russia

Threat	Area	Intensity	Urgency	Total Ranking
Category 1: Habitat & Prey Related				
1. Prey Reduction due to Illegal Hunting	5	3	3	11
Category 2: Direct Killing or Removal of Snow Leopards				
1. In Retribution for Livestock Depredation	2	4	3	9
2. Poaching for Trade in Hides or Bones	5	3	3	11

Threat	Area	Intensity	Urgency	Total Ranking
3. Secondary Poisoning and Trapping of Snow Leopards	4	5	5	14
Category 3: Policy and awareness issues affecting conservation of snow leopards, prey and habitat				
1. Lack of Appropriate Policy	5	4	4	13
2. Lack of Effective Enforcement	5	4	5	14
3. Lack of Awareness Among Local People	4	4	4	12
Category 5: Emerging Threats				
1. Direct & indirect threats due to mineral exploration & mining (local)	1	5	5	11

On Ranking Threat Values

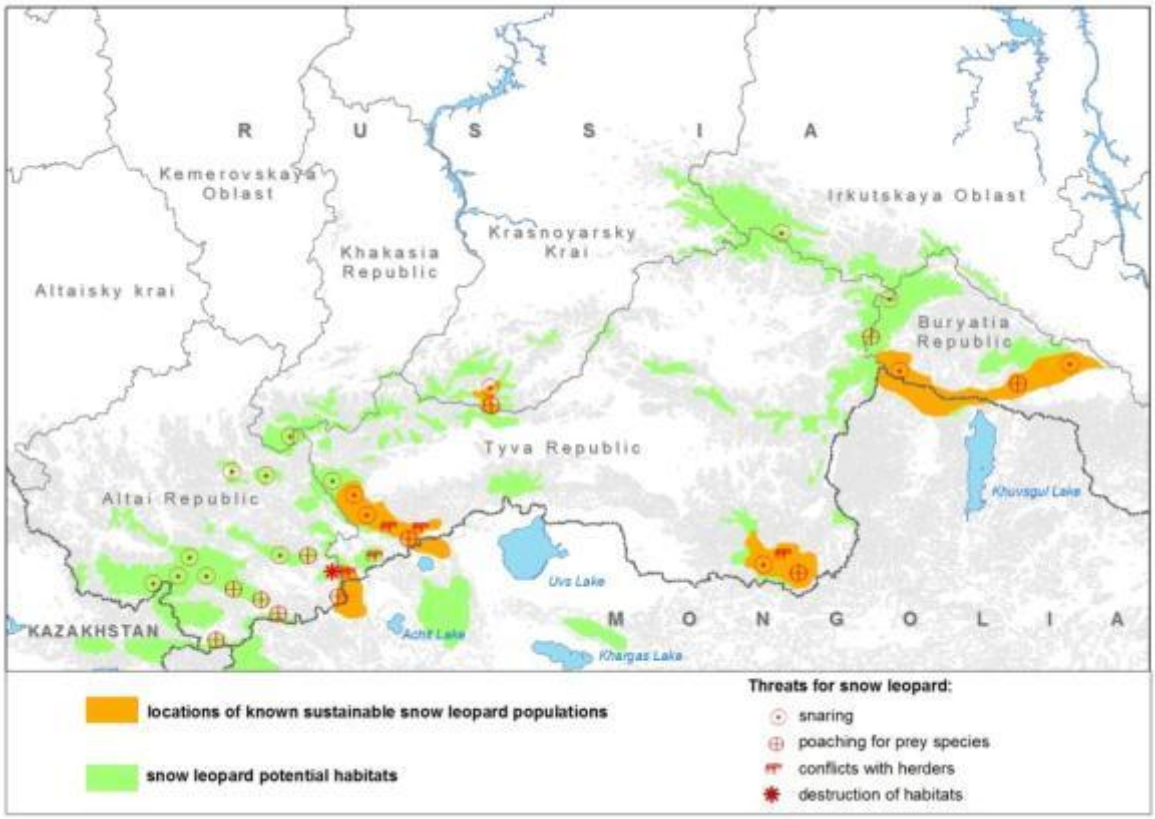
0 or 1 = no or low threat; 2 or 3 = intermediate threat level; 4 or 5 = high threat level

AREA: Rank each threat according to how wide-spread it is (where 5 indicates it occurs across most or all snow leopard range within country; and where 1 indicates it is extremely limited in areal extent)

INTENSITY: Threats ranked from 5 = the most destructive impact to 1 = the least negative impact

URGENCY: Rank each threat identifying if it needs immediate & urgent attention (very time sensitive) (value = 5) to being of least concern or urgency (value = 1)

Map 3. Key threats for snow leopard in Russia



The most important direct threats include the killing of snow leopards as a result of poaching or protecting livestock from this predator. **Indirect threats** having the greatest influence on reducing snow leopard populations are decreased prey base, and future habitat destruction due to mining development.

Direct threats

Snow leopard killing due to poaching

This is perhaps the most serious threat to the continued existence of snow leopards in Russia and other countries. Snare-hunting presents the greatest danger to this predator and it is commonly used throughout almost the entire species' range in Russia. Thanks to predictable behavior – snow leopards haunt the same trails and paths along ridges – the cats can easily identifications by poachers and entrapped in snares set along mountain ridges and narrow trails. Snares are often set so densely that snow leopards have almost no chance of escaping alive. They can be hunted for their valuable pelts and other derivatives, but more often than not, they are just victims of snare-hunting targeting musk deer and other species.

Local residents, mainly herders and hunters who overwinter in snow leopard habitat, are the main poachers, killing big cats and other species in snares. High prices for derivatives of snow leopards, musk deer, and other species are the main reason for the mountain snaring industry and animal parts are one of the very few income sources for local residents living in snow leopard habitat in the Altai-Sayan Ecoregion. As a rule, enforcement agencies only very rarely notice snare poachers who work in difficult-to-reach snow leopard habitat. Give the high intensity of snare poaching, key groupings of snow leopard in Russia could be wiped out in just 10-15 years.

Snow leopard deaths due to livestock attacks

Persecution of snow leopards by herders due to attacks on livestock is a serious threat to the existence of snow leopards as well. In Russia, the problemis particularly relevant in western Tuva and to a much lesser degree on the Sengelen Ridge (southeastern Tuva). As a rule, attacks occur when livestock are pastured directly in the big cat's habitat and/or the population of wild ungulates (the snow leopard's main prey base) is noticeably reduced due to poaching. Other reasons for snow leopard attacks on livestock include supervised livestock grazing and corrals that are poorly protected from predators.

Snow leopards may attack both small (goats and sheep) and larger animals – yaks and horses – attacking in pastures or in corrals where livestock are kept overnight. While a snow leopard will only kill 1-3 animals in a single attack in open landscape, in a corral the predator is capable of killing or wounding dozens of panicking animals (up to 80 head), resulting in tremendous losses for the herder. In turn, corrals become traps for the snow leopard itself, which is not always sable to jump out again through the corral roof from among panicked sheep and goats. Increasing numbers of livestock in snow leopard habitat will lead not only to increased conflicts with herders, but also to crowding out wild ungulates that form the natural prey base of snow leopards in mountain pastures.

Indirect threats

Decreases in snow leopard prey base populations

It is well known that predator population numbers depend directly on the population status of the species upon which it preys. As a result, a decreased numbers of ungulates– the snow leopard's main prey – are one of the most important factors that determine a decrease in snow leopard populations.

In most cases, this is also related to poaching. For example, in western Tuva the main reason for frequent snow leopard attacks on livestock is believed to be a sharp drop in wild ungulate populations in the mountains as a result of intensive hunting. Numbers of mountain ungulates remain relatively low in relatively accessible parts of snow leopard habitat. Snare poaching for musk deer is very common in snow leopard habitat and severely reduces not just one of the snow leopard's prey species, but also presents an extreme risk for the predator as well.

In addition, decreases in wild ungulate populations facilitate the development of free-range livestock farming in snow leopard habitat. As a rule, livestock pasturing results in noticeable disturbances and crowds wild ungulates out of grazing habitat.

Development of economic infrastructure and habitat destruction

Road construction in snow leopard habitat significantly increases access for poachers and herders, which generally results in decreased numbers of snow leopard prey and increased conflict between the cat and herders. One example of this is the construction of a road between Mugur-Aksy and Sagly by way of Tsagan-Shibetu Ridge that resulted in decreased numbers of Siberian ibex.

Construction of a natural gas pipeline and road across Russia's Ukok Platea uinto China could also have a negative impact on snow leopard populations in the Argut River basin and Tabyn-Bogdo-Ola Ridge due to the potential disruption in wildlife corridors for this species between Russia, western Mongolia, and China.

Mining can also lead to the destruction of key snow leopard habitat in certain areas. Currently, there is a threat on the central Chikhachev Ridge where there are several polymetallic deposits planned for wide-scale development in immediate proximity to transboundary snow leopard habitat. Development of these deposits is linked not only to habitat destruction for snow leopards but also to increased disturbance factors and increased poaching with regard to ungulates and the snow leopard itself.

Dealing with above threats

Replicating known good practices (mainly for traditional threats)

Great majority of the special projects aimed to snow leopard conservation in Russia in 2002-2012 was funded by WWF-Russia and UNDP/GEF Project "Biodiversity conservation in the Russian portion of Altai-SayanEcoregion"(2006-2011). Since 2010 Russian Academy of Science started snow leopard research and monitoring program in South Siberia under supervision of the President of Russian Federation Vladimir Putin. In 2011 initiative of Sayano-Shushensky Zapovednik to protect snow leopard population in Western Sayan Mountains was supported by the Russian Geographical Society.

In 2002-2012 some projects devoted to snow leopard monitoring and conservation were implemented by protected areas and regional conservation NGOs in Altai Republic, Tuva Republic and southern part of Krasnoyarsky krai with the support of national and international foundations and organizations (Strana Zapovednaya Foundation, Sibirskoe Zdorovie Corporation, Citi Foundation, Panthera, US Fish and Wildlife Service, Snow Leopard Conservancy, Weeden Foundation, Altai Project and others).

Successful practices for conservation of snow leopard in Russiaarethe following:

A. More than **900,000 ha of new protected areas were established** in potential snow leopard habitats in Russia. Currently, an assortment of protected areas covers 23% of potential snow leopard habitat in the Russian part of the species' range. However, just 16% of known sustainable snow leopard populations habitat in Russia falls within a protected area. Establishing of Protected Areas (especially Zapovedniks and national Parks) is one of the most effective ways to protect snow leopard populations and habitats. Protected areas deal with a whole complex of direct and indirect threats to snow leopards (eliminate poaching and prevent habitat destruction and degradation due to unsustainable economic development). At least 400,000 ha more of protected areas should be established in Russia to protect sustainable snow leopard populations in Altai, Tuva and Buryatia Republics, as well as southern part of Krasnoyarsky kray.

B. **Three inter-agency anti-poaching brigades were established in Altai Republic, Tyva Republic and southern part of Krasnoyarskykrai** for regular patrolling of snow leopard habitats. Due to regular patrolling the number of poacher's snares in two key snow leopard habitats (Argut River Watershed and Sayano-Shushensky Biosphere Zapovednik) decreased 3.5 times. Anti-poaching brigades can effectively eliminate poaching (especially snaring) for snow leopards and their prey species. This practice can be replicated in Buryatia Republic and Western Tuva.

C. In 2007-2008 as part of the UNDP/GEF and WWF program**, more than 70 herders in Tuva Republic were trained in the simplest means of strengthening corrals** with the use of metal mesh, and more than 40 corrals were protected from snow leopard attack on Chikhachev Ridge, Mongun-Taiga Massif, Tsagan-Shibetu and Shapshalsky Ridges. Since then there has not been a single case of a snow leopard gaining access to a corral in western Tuva (prior to this 56% of all livestock killed by snow leopards in western Tuva died in corrals). In result of this project number of snow leopard south-western Tuva increased from 10-12 up to 15-20 individuals. Corral improvement can be replicated in Argut River Watershed, Altai Republic, as a measure to prevent snow leopard attacks on livestock after successful restoration of local snow leopard population.

D. **More than 70 families of local people living in the snow leopard habitats in Altai Republic were provided with micro-loans and grants** and started to develop legal small business as alternative to poaching (WWF and Citi Foundation project).In result of the project level of poaching in snow leopard habitats in Altai decreased since 2010 by 10-15%. This measure in complex with anti-poaching can effectively affect poaching and can be successfully replicated in Western Tuva, Buryatia Republic and southern part of Krasnoyarsky kray.

Developing new counter measures (for new threats) including pilots where needed

New arising threat for snow leopard populations in Russia is development of mining industry and linear infrastructure in the mountain regions of South Siberia and adjacent areas of Western Mongolia, North-eastern China and Eastern Kazakhstan. This kind of economic development is linked not only to habitat destruction for snow leopards but also to increased disturbance factors and increased poaching with regard to ungulates and the snow leopard itself.It is especially dangerous when occurs in the habitats of transboundary snow leopard populations at the border of Russia, Mongolia, China and Kazakhstan. The preservation of transboundary parts of the snow leopard's range at the intersection of Russia, Mongolia, Kazakhstan, and China is of particular importance to overall snow leopard conservation in the animal's northernmost range. These areas connect large populations of the species in western Mongolia and northwestern China with sparse groups of snow leopards in Russia.

Another threat that can directly and indirectly affect snow leopards, their habitats and prey species is consequences of global climate change. In the context of global climate change impacts on ecosystems and particular species (including snow leopard), dramatic changes in pasture conditions, availability of water sources, snow cover distribution and high frequency of catastrophic events (harsh winters and droughts) are of primary concern. Results of climate change assessment in Russian and Mongolian part of Altai-SayanEcoregion indicate that warming is taking place: the average rate of warming during 1976 and 2008 in the Russian part of the ASER was 1.85 degrees C, which is judged quite significant (Kokorin et al. 2011). Additionally, forecasts predict the increase of the annual maximum temperatures to continue with another 3.4 degrees C during the next 20-30 years, with regional variations (Kokorin et al. 2011). Aside from temperature increase, the ASER will likely be impacted by increased period of droughts, reduced precipitation, permafrost degradation, earlier dates of river ice break, decreased thickness of ice cover, changes in annual precipitation leading to changes in water run-off and increased probability of dangerous floods, increase of evaporation, and acidification of lakes.

The counter measures to deal with these threats should involve a complex of following national and transboundary activities:

A. In federal law of Russia #174 “On the environmental impact assessment report”, change and amend the text to require project documentation of any mining and capital construction projects occurring in the habitat of snow leopards and other Red Book-listed species to undergo a government environmental impact report (expertiza)

B. Develop and approve a program of actions for snow leopard conservation in the Russia-Mongolia transboundary zone, as well as in Russia and Kazakhstan

C. Develop and expand international transboundary Russian-Mongolian protected areas for the protection of snow leopards and other rare species on Chikhachev, Tsagan-Shibetu, Sailyugem, and Tunkinsky Ridges and the mountains around Khuvsgul Lake

D. Expand the "Golden Mountains of Altai" UNESCO World Heritage site in the transboundary area of Russia, Mongolia, China, and Kazakhstan

E. Coordination of science programs and development of collaborations among specialists in Russia, Mongolia, China, and Kazakhstan to study global climate change impact on ecosystems and endangered species of Altai-SayanEcoregion. The results of these research and climate driven habitat change modeling should be used for development of climate-smart international strategies for conservation of endangered species and sustainable development of local communities of the Ecoregion.

Organization, empowerment, and support

National institutions for SL conservation: strengths and weaknesses to be remedied

To deal with current and future threats to snow leopard and its habitats different stakeholders should work together. National institutions for SL conservation in Russia are represented by Ministry of Nature Resources, Regional Wildlife Protection Agencies, Federal Protected Areas, Regional Protected Areas, Russian Academy of Science, International Organizations (WWF), Regional Conservation NGOs, and Local Communities. Strengths and weaknesses of these stakeholders are explained in the Table 3.

Table 3.National institutions for SL conservation in Russia: strengths and weaknesses

Organization	Strengths	Weaknesses
I. Ministry of Nature Resources	• Real political power and direct dialog with Government • Development of appropriate conservation policies and legislation • Establishing of new Protected Areas	• Lack of professional species experts • Quick rotation of government employees • Greater attention to resource exploitation than biodiversity conservation
J. Regional Wildlife Protection Agencies	• Real rights to fight poaching in snow leopard habitats on large areas	• Lack of appropriate funding • Lack of equipment and vehicles • Low number of professional inspectors
K. Federal Protected Areas	• Professional staff for protection and monitoring of snow leopard • More or less sustainable funding • Developed environmental education programs	• Limited area under protection • Rights to stop poachers only inside Protected Area • Restricted funding for snow leopard conservation and monitoring
L. Regional Protected Areas	• Appropriate location and area for snow leopard conservation • Local staff and good knowledge of snow leopard distribution	• Lack of sustainable funding • Lack of professional staff • Very limited staff • No rights to stop poachers
M. Russian Academy of Science	• Highly professional research team • Professional equipment for advanced research programs on snow leopard	• Lack of permanent funding for research • Low conservation implication of research programs
N. International Organizations (WWF)	• Highly professional conservation experts • Long-term conservation programs • Transboundary cooperation in conservation	• Lack of permanent and sufficient funding for snow leopard conservation • Lack of fundamental scientific research of snow leopard ecology
O. Regional	• Professional team of local conservationists and researches	• Small number of professional experts • Lack of sustainable funding

Organization	Strengths	Weaknesses
Conservation NGOs	• Good knowledge of key snow leopard habitats • Cooperation with local and regional government organizations	• Lack of long-term conservation programs for endangered species
P. Local Communities	• Live directly in the habitats of snow leopard • Traditional knowledge and lifestyle • Excellent knowledge of snow leopard distribution in limited areas	• Dependence on poaching as a source of income • Poverty and unemployment • Low interest in conservation of snow leopard

One of the most effective ways to overcome the above weaknesses of different stakeholders involved in conservation of snow leopard, its habitats and prey species is **development of strong conservation collaborations and partnerships between all of them**.

Legal framework for protecting SL and habitat: strengths and weaknesses to be overcome

Red Books

Snow leopards are still inscribed in the Russian Federation Red Book and are members of Category I – threatened with extinction at the periphery of the species' habitat. Snow leopards are listed in the Red Books of 7 Russian Federation subjects–the Republics of Altai, Tuva, Khakasia, and Buryatia, Irkutsk Oblast, and Krasnoyarsk and Zabaikalsky Krais.

Legal and other regulatory acts in the Russia Federation

In Russia, the key regulations concerning the conservation and use of animals, including snow leopards, and their habitats are contained in conservation laws, including these key acts:

- Federal law FZ #7 "On environmental protection" (dated 10 January 2002)
- Federal law FZ #52 "On the animal world" (dated 24 April 1995)
- Federal law FZ #33 "On protected areas" (dated 14 March 1995)
- Other legislative acts, federal decrees, and departmental regulatory acts, and regulatory acts in other legal branches (civil, criminal, administrative laws).

The federal law "On the animal world" is the primary legislation in this arena. It regulates relationships between enforcement and use of the animal world overall, as well as in the framework of habitat conservation and restoration for the purposes of ensuring biological diversity, sustainable use of all components, establishing conditions for wildlife sustainability, conservation of the genetic fund for wildlife, and other protections for wildlife as an intrinsic part of the natural environment.

In order to ensure enforcement and use of wildlife and habitat conservation and restoration, the law presumes requirements to conduct government surveys of wildlife and their use and a government cadaster of wildlife, to conduct government wildlife monitoring, and to implement government conservation programs for wildlife and wildlife habitat. In addition, the law requires the government to protect wildlife by demanding a government environmental impact report (*expertiza*) to precede any economic decision with the potential to impact animals and their habitat.

To a significant degree, numerous sub-legislative and agency-level regulatory acts are the working legal foundation of management and law enforcement agencies in conservation activities, regulate the use of rare and threatened species, protect habitat, and provide a regulatory mechanism with reasonably well-defined jurisdiction and distinctions between federal and regional government agencies.

However, the effectiveness of this working system for regulatory management is significantly reduced both by the absence of a sufficiently effective enforcement policy and the presence of regulatory, legal, and methodological loopholes in the system in a number of areas.

Article 20 of the federal law “On the animal world” establishes the government environmental impact assessment (*expertiza*) as a mandatory measure to protect wildlife. The assessment must precede finalizing any economic decisions with the potential to impact animals and their habitat. However, in the event that economic activity resulting in environmental impact stakes place outside a protected areas, then the government environmental impact report is not required, nor is there a legal basis forbidding the activity, even if it has the potential to negatively impact snow leopard habitat.

Wildlife law enforcement and combating crime: current practice and areas for improvement

Between 2000 and 2011 there were almost no cases prosecuting poachers for killing snow leopards and during that entire period only 2 cases of illegal hunting of snow leopards were discovered. The guilty parties managed to escape culpability in both cases. Between 2000 and 2011 there were a number of instances when contraband snow leopard pelts entered Russia (Altai Republic) from Mongolia. All violators were prosecuted for criminal smuggling.

Currently regional wildlife protection agencies in South Siberia have very limited or no funding, staff and equipment for effective conservation of snow leopard and other endangered species. In Altai and Tuva Republics and southern Krasnoyarsk Krai, hunting is today the primary occupation (second to livestock farming) of many residents left unemployed after the collapse of Soviet collective farms and other enterprises. Many villages depend to a significant degree on hunting and gathering in the mountains and taiga forest. Local residents have significant numbers of illegal and unregistered weapons, a fact that is affirmed by the confiscation of dozens of such weapons every year.

It is very necessary to ensure effective work by regional wildlife protection agencies in the fight against poaching in snow leopard habitat by allocating additional funding from the federal budget. In doing so, enforcement staff must first and foremost be focused on the fight against illegal snare-hunting in snow leopard habitat. Is it also necessary to devote more attention to the fight against illegal trade in products and derivatives of musk deer and other hunting species. Development of cooperation with conservation and enforcement agencies to fight illegal trade in snow leopards and other rare species, as well as hunting species is very urgent. WWF and UNDP/GEF’s extensive experience in creating and supporting interagency anti-poaching brigades can be used to advance this work.

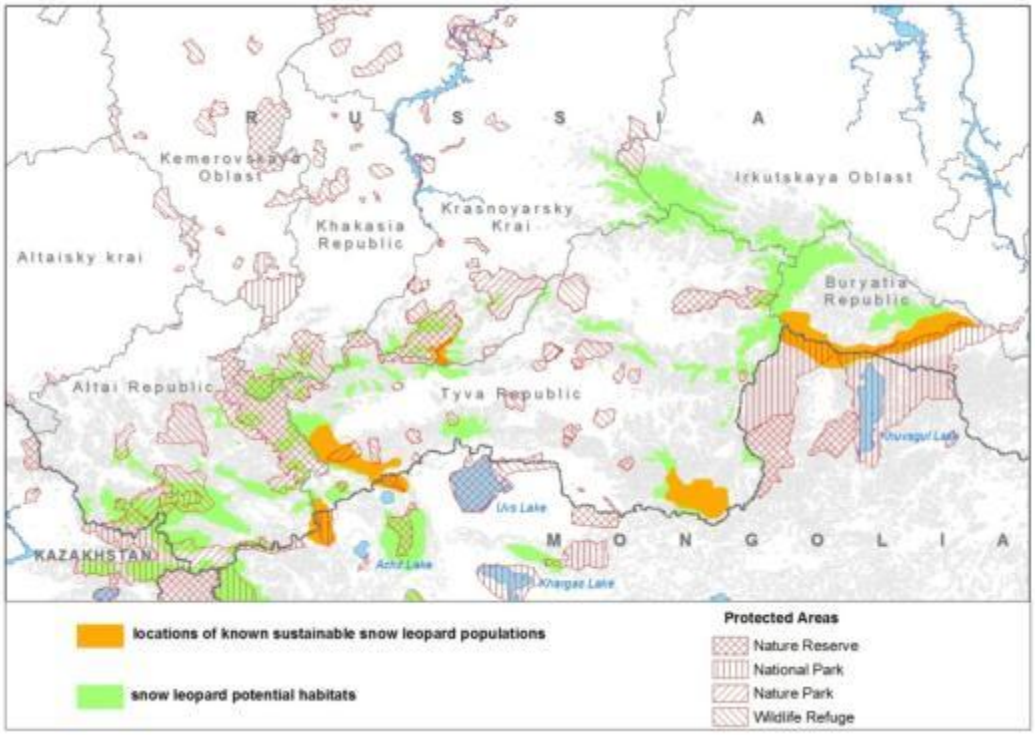
Currently, an assortment of protected areas cover 23% of potential snow leopard habitat in the Russian part of the species’ range (Map 4). However, just 16% of known sustainable snow leopard populations habitat in Russia falls within a protected area.

It should also be noted that in many of these protected areas, snow leopard conservation enforcement is insufficient. A number of protected areas require a change in status, optimization of the lands, and a strengthened enforcement regime. Transboundary cooperation between Russian and Mongolian protected areas requires urgent improvements for the preservation of transboundary snow leopard populations.

Suggestions for improvement:

- Provide regional wildlife protection agencies in South Siberia with sufficient funding, transportations and equipment, and trained professional staff
- Develop legal regulations for prosecuting individuals advertising in the media and on the internet for the sale of pelts and other snow leopard derivatives, for acquiring personal property of products produced by illegal hunting for that species, as well as prosecuting the people lodging those advertisements
- Strengthen the administrative and criminal responsibility for poaching, illegal transportation and trade of snow leopards and other species listed in the Russian Federation Red Book
- Completely prohibit harvesting of musk-deer in the habitats of sustainable snow leopard populations
- Develop and approve Rules for trade in products derived from hunting species and species listed in the Russian Federation Red Book

Map 4. Protected Areas in snow leopard habitats in Russia



Legal framework for empowerment of community for co-management of wildlife and habitat; current practice and areas for improvement

Considerable improvement of legal framework in Russia is necessary to provide local communities in the habitats of snow leopard with the rights and funds to manage their resources for the long-term. Now such nature resources as game, forest, medicine plants, and considerable part of pastures are government property. Thus, local community have very limited or no rights at all to manage these important resources in the areas where they live. People do not feel ownership of these resources and are often involved in illegal consumption of the resources including poaching. Nonetheless local communities have legal rights to rent hunting lands and establish non-government organizations of hunters and manage wildlife. Also, local communities can build pasture land management groups and use grazing resources in sustainable manner. In reality communities in South Siberia have very limited capacities, professional staff and financial resources to develop game or pasture community based management systems in the habitats of snow leopard. Special focus on actions is required to make local communities in and around habitats of snow leopard aware of their ecological and legal rights. The assumption is that with increased awareness and encouragement, the communities will also feel increased ownership and will actively participate in conservation activities for snow leopard and mountain ecosystems, like planning, management and enforcement and will practice sustainable management principles for their natural resources.

In order to increase the effectiveness of snow leopard protection and ensure conservation of its habitat by local communities it is advisable to:

- Develop strategies and plans to develop community managed hunting lands in Altai and Tuva Republics, as well as in southern Krasnoyarsk Krai
- Improve conditions for economic development of community managed hunting lands in which snow leopards are present, including attracting investments and other extra-budgetary funds

- Track the condition of livestock corrals in snow leopard habitat and strengthen and improve them in timely fashion to prevent large losses of livestock due to predator attack. Protection of corrals from snow leopards is an extremely effective measure for reducing conflicts between herders and snow leopards
- Develop and implement a system to encourage herders to protect snow leopards
- Attract additional funding to develop tourism, small business, manufacturing, and jobs creation with the goal of ensuring local employment and providing alternatives to poaching

In preparing socio-economic development programs, priority should be given to programs and projects that have minimal impact on the environment and snow leopard habitats. Such projects and programs include development programs for ecological and rural tourism, the implementation of which directly depend on the degree to which mountain ecosystems remain intact and accessible for viewing large animals such as Siberian ibex, argali, and red deer. Implementation of multiyear ecotourism programs in snow leopard habitats permits the active engagement of local residents in servicing tourists and volunteers traveling to the region to learn about snow leopards. In this way, snow leopards can become a building block of the herding community's local economy living in this predator's habitat.

Support mechanism for building community organizations: current practice and needed strengthening

Currently more than a 100 community NGOs exist in the habitats of snow leopard in South Siberia. Great majority of them are represented by indigenous organizations devoted to protect traditional lifestyle of nomadic and semi-nomadic people, and support sustainable development of local indigenous communities. Being heavily dependent on renewable natural resources such as game species, pastures and non-timber forest products, still not many people within the community organizations are aware of how to use procedural, judicial and informational mechanisms (such as public hearings and public Environmental Impact Assessments which are legally granted by Constitution of Russian Federation) to defend their rights to a clean environment and nature resources management. These grassroots NGOs are very weak in terms of a number of qualified experts, resources and expert capacities to be able to tackle resource-management issues independently. There is a crucial necessity to create new groups of activists which could act on a permanent basis as environmental watchdogs on behalf of interests of particular local communities in key settlements located in snow leopard habitats in South Siberia. Community organizations have very limited access to funding and currently do not play any considerable roles in conservation and nature resource management.

To increase capacities of community organizations in conservation of snow leopard and sustainable management of nature resources it is necessary to:

- Provide local communities and community organizations with real legal rights to protect and manage nature resources in the areas of their traditional land use
- Organize capacity building programs for community organizations to increase their knowledge and skills in leadership, management, and use of procedural, judicial and informational mechanisms to defend rights of indigenous communities to a clean environment and community-based nature resources management
- Provide access for local community organizations to national and international sources of funding to support their conservation, nature resource management and sustainable development activities in the mountain regions of South Siberia

Research and training

Development and implementation of programs for education and training

The conservation of biological diversity including that of rare and threatened species requires current basic science and analysis. Today, there is only very limited data has been gathered about snow leopard biology and ecology. **In**

developing a phased program for the scientific study of snow leopards in Russia, the following areas should be considered:

- Study the snow leopard's current range, populations, and other dynamics, and create improved maps of the species' habitat distribution; study the roles of natural and anthropogenic factors in population dynamics and changes in snow leopard habitat; identify key sites for snow leopard reproduction.
- Clarify snow leopard population structure by using genetic analysis and other advanced techniques; study genetic relationships and the degree of genetic isolation of various snow leopard populations; identify potential migration corridors between snow leopard populations in Russia and western Mongolia, evaluate their significance for species conservation in Russia.
- Zoological and veterinary research on snow leopards in various populations.
- Develop programs for the restoration of snow leopard groupings or reintroduction of this species in habitats where poachers previously eradicated the cat.
- Particular attention must be paid to applied science for the development and implementation of measures aimed at preserving viable snow leopard populations in conditions of regional socio-economic development and context of global climate change. The study of snow leopards and other rare species should be priority topics in nature reserve programs and in higher education.

Cooperation in the application of results of scientific research

International partnerships (particularly between Russia and Mongolia) should form the basis for effective application of the scientific research results. This will ensure the exchange of scientific ideas and the most current international experience, joint scientific research efforts, data sharing, and a certain degree of financial support.

For each research conclusion the key stakeholders in the Altai-Sayn should agree on and adapt the research results in their conservation strategies and action plans at local, national, and at the transboundary level. To do so, national and international facilitators for snow leopard conservation may organize annual meetings of key stakeholders including governmental agencies, scientific institutions, NGOs, and individual researchers. In these meetings stakeholders may share their research results and propose actions to the governments on how to adapt their current and future conservation efforts.

Time-phased implementation program, budget, and indicators for snow leopard conservation in 2013-2022

Program impact:mountain ecosystems representing key snow leopard habitats sustain unique biodiversity and benefit to local communities and sustainable regional development.

Ten year National Goal:restore the total population of Snow Leopard in the Russian Federation from current 70-90 up to 110-120 individuals by 2022.

Five year National Goal:increase the number of at least 6 key snow leopard populations in the Russian Federation on 15-20% by 2017 (from current 45-55 to 65-70 individuals) (Map 5).

Program outcomes:

A. By 2017 have at least six sustainable snow leopard populations with total number 65-70 individuals in Russia
B. By 2022 have total population of Snow Leopard in the Russian Federation up to 110-120 individuals

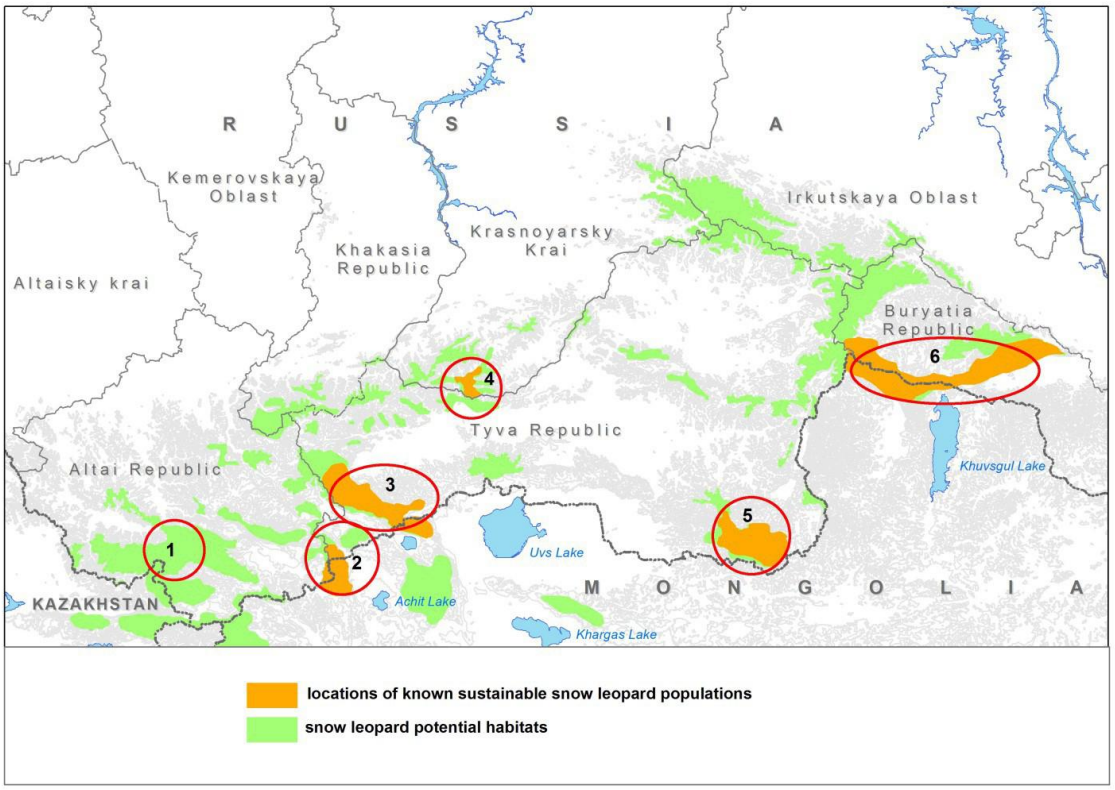
Program result indicators:

A. Number of snow leopards on model monitoring areas identified by camera trapping and DNA analysis

B. Number and population density of key wild prey species (Siberian ibex, maral deer, roe deer, musk deer, argali, marmot, and others)
C. Number of herders families those are aware on economic importance of snow leopard conservation and involved in its protection

General actions to implement these Goals are presented in the Excel Tables(Appendix 1).

Map 5. High priority areas for snow leopard conservation in Russia in 2013-2022



2. **Argut River Watershed**
3. **Southern part of Chikhachev Ridge and Mongun-Taiga Massif**
4. **Tsagan-Shibetu Ridge, southern part of Shapshal Ridge and western part of Western Tannu-Ola Ridge**
5. **Sayano-Shushensky Nature Reserve and adjacent area of Khemchiksky and Kurtushubinsky Ridges**
6. **Sengelen Ridge**
7. **Okinsky and Tunkinsky Ridges**

Tracking implementation progress and monitoring results

Scientific monitoring of SL, habitat, and threats: current practice and areas for improvement

Effectively, beginning in 2004, monitoring of the status of key snow leopard populations in the Altai-SayanEcoregion has been done by staff from Altaisky, Sayano-Shushensky, and Ubsunurskaya Kotlovina Nature Reserves, with support from WWF and UNDP/GEF (“Conservation of Biodiversity in the Russian Altai-SayanEcoregion”).

In 2009, the “Snow Leopard Monitoring Program in the Russian Federation” was published using data from these studies (Spitsyn et al., 2009).

The goal of the Monitoring Program was to ensure the annual collection of accurate information on the condition of key populations of the species in Russia as the basis for developing practical measures for long-term conservation.

The Monitoring Program’s Objectives were as follows:

- Annual calculation of populations and dynamics of key populations of snow leopards

- Data collection on structure and changes in the species' habitat, spatial, sex, and age structures of populations, reproduction and mortality levels, condition of habitat, and anthropogenic factors.

Snow leopard Monitoring Program Activities included:

- Annual winter surveys on fixed transects within key habitats (to seek out tracks in the snow on fixed routes)
- Camera-trapping on model monitoring areas (since 2010)
- Year-round collection of reports of human encounters with snow leopards in the Altai-SayanEcoregion and outside its borders

Program of study and monitoring the snow leopard in South Siberia of Russian Academy of science was approved by the President of the Russian Academy of Sciences and realize with the financial support of the Russian geographical society and under the patronage of the President of the Russian Federation. The program was started in 2010. The main block of this programs is:

- Study of the spatial structure of populations with the use of modern and traditional methods (satellite tagging, automatic came traps,, tracing, etc.).
- Study of the modern range of the snow leopard (field work and modeling potential habitat).
- Molecular-genetically research.
- Study of hormonal status, and stress level
- Monitoring diseases and parasites
- Prey predator system
- Relationships with competitors and role in ecosystems

Monitoring implementation progress through Key Indicators: setting up a robust system

Implementation of National Snow Leopard Conservation Program in Russia requires a set of progress indicators based on the key planned Program outputs. We suggest the following set of progress indicators for our country:

- Number of amended and approved legislation acts directed to protection of snow leopard and its habitats;
- Total Area and annual funding of Protected Areas in the habitats of sustainable snow leopard populations;
- Annual funding, number of staff, and number of anti-poaching raids of regional wildlife protection agencies in the key habitats of snow leopards;
- Number of local herders and donors involved in incentives programs for conservation of snow leopard;
- Number of international transboundary programs for conservation and monitoring of snow leopard developed by Russia, Mongolia, China and Kazakhstan;
- Number and total area of transboundary PAs established for protection of transboundary snow leopard populations;
- Number of big industrial companies involved in protection of snow leopard and its habitats, and amount of funding these companies provide annually for conservation programs.

Summary of costs and financing possibilities

Capital and operating costs by component, phased over seven years

Annual expenses for snow leopard conservation and monitoring in Russia include such items as follows:

- Improvements in the legal and regulatory sphere aimed to effective protection of snow leopard and its key habitats
- Development and support of a network of protected areas in the key habitats of snow leopard
- Increasing the effectiveness of snow leopard protection outside of protected areas
- Scientific research directed to better understanding of snow leopard distribution, population structure, prey base, habitats, migration corridors, and survival rates
- Monitoring the status of key snow leopard populations

- Outreach and education activities to establish positive image of snow leopard as a symbol of Altai and Sayan Mountains and engage local communities in the species monitoring and conservation

These activities in 2016-2012 years were implemented due to funding from different sources described in the Table 5. Priority actions and their costs for snow leopard conservation in Russia in 2013-2022 are explained in the Tables 6.

Table 5.Average annual expenses for snow leopard conservation and monitoring in Russia for 2006-2012

Sources of funding	Average annual sum, USD (2006-2012)
Ministry of Nature Resources	2,500,000
Russian Academy of Science	180,000
WWF-Russia	150,000
UNDP/GEF Project (2006-2010)	40,000
Other international organizations	20,000
TOTAL	**$2,790,000 per year**

Table 6.Necessary funding for snow leopard conservation in Russia for 2013-2022

	Priority Actions	Required Budget, USD
A.	Improvements in the legal and regulatory sphere aimed to effective protection of snow leopard and its key habitats	70,000
B.	Development and support of a network of protected areas in the key habitats of snow leopard	30,000,000
C.	Increasing the effectiveness of snow leopard protection outside of protected areas	40,000,000
D.	Scientific research directed to better understanding of snow leopard distribution, population structure, prey base, habitats, migration corridors, and survival rates	1,600,000
E.	Monitoring the status of key snow leopard populations	1,800,000
F.	Outreach and education activities to establish positive image of snow leopard as a symbol of Altai and Sayan Mountains and engage local communities in the species monitoring and conservation	2,000,000
Total budget for ten years		**$75,470,000**
Annual budget		$7,547,000
Available according to the average annual expenses (2006-2012)		$2,790,000
Annual funding gap		$4,757,000

Major Funding Gaps

As seen from the Table 6 total funding gap between current and needed funds for snow leopard conservation in Russia is $4,757,000/year. Measures to fill out this gap are needed to be developed by key stakeholders at international, national, and at the regional levels.