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NEASPEC

Transboundary Cooperation for Conservation of Amur Tigers, Amur Leopards and Snow Leopards in North-East Asia

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This summary report was prepared by Ms. Anoushka Ali, who synthesized technical reports prepared by experts from China, Mongolia, and the Russian Federation, with a view to presenting the key findings and recommendations of the NEASPEC project on “Transboundary Cooperation for Conservation of Amur Tigers, Amur Leopards, and Snow Leopards in North-East Asia”.

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Executive Summary

The project, **"Transboundary Cooperation for Conservation of Amur Tigers, Amur Leopards and Snow Leopards in North-East Asia",** implemented by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) Subregional Office for East and North-East Asia (SOENEA) under the North-East Asian Subregional Programme for Environmental Cooperation (NEASPEC), aimed to promote and institutionalize transboundary, intergovernmental cooperation between China, Mongolia and the Russian Federation for the long-term conservation of these vulnerable feline species.

The Amur tiger and Amur leopard are endangered subspecies found in the far eastern regions of the Russian Federation and in the north-eastern regions of China. The Snow leopard, listed as a vulnerable and rare species, inhabits high-altitude regions across Central and South Asia, including parts of Mongolia and the Russian Federation.

Recognizing the transboundary nature of their habitats, the project focused on enhancing cross-border cooperation through targeted research and institutional engagement. It contributed to the environmental dimensions of the 2030 Agenda for Sustainable Development, in particular to the achievement of the Sustainable Development Goals (SDGs), particularly SDG 15: Life on Land and its targets 15.5, 15.7 and 15.C, and SDG 17: Partnerships for the Goals and its target 17.14.

Through three components, the project conducted extensive monitoring and research across key transboundary habitats to assess the population characteristics and spatial distribution of the Amur tiger, Amur leopard and Snow leopard.

Component 1. Transboundary cooperation to conserve Amur tigers and leopards between the Northeast Tiger and Leopard National Park (NTLNP) in China and the Land of the Leopard National Park (LLNP) in the Russian Federation.

Component 2. Transboundary cooperation between protected areas in the Lesser Khingan Mountains to conserve Amur tigers.

Component 3. Assessment of the current status of two Snow leopard subpopulations in the transboundary areas between Mongolia and the Russian Federation.

This report synthesizes technical data collected across the Sino-Russian and Mongolian-Russian corridors, identifies major challenges and provides recommendations for strengthening conservation and governance mechanisms for these big cats in North-East Asia.

Population Characteristics: Key Findings

Monitoring and implementation of activities conducted under Components 1 and 2 aimed at assessing the populations of the Amur tiger and Amur leopard. In particular, Component 1 also focused on the proposed establishment of a Sino-Russian Transboundary National Park ("Land of Big Cats"), covering about 18,000 km², combining the Northeast Tiger and Leopard National Park (NTLNP) in China and the Land of the Leopard National Park (LLNP) in the Russian Federation. Research revealed significant population recovery over the survey period (Table I).

Table I. Population status of Amur leopards and Amur tigers over the survey period

Species	Location	Population (survey start year)	Population (survey end year)
Amur leopard	SW Primorye, The Russian Federation	53 (2014)	111 (2021)
Amur leopard	China	12 (2013)	60 (2020)
Amur tiger	SW Primorye, The Russian Federation	30 (2014)	60 (2021)
Amur tiger	China	7 (2013)	50 (2020)

Component 2 examined the population of the Amur tigers in the Lesser Khingan Mountains, a critical ecological corridor between China and the Russian Federation. **Monitoring confirmed a stable population in the Russian Jewish Autonomous Prefecture and cross-border movement into Heilongjiang Province.** Since 2014, at least eight wild Amur tigers have been consistently active and, in 2021, the female tiger “Lazovka” and her cubs were frequently detected in the area.

Snow leopard populations were assessed under Component 3 of the project, across the Russian-Mongolian transboundary regions. Monitoring was conducted in the Tsagan-Shibetu (Tuva, the Russian Federation and Tsagaan-Shuvuut, Mongolia); the Chikhachev Ridge (Republic of Altai, the Russian Federation and Mongolia); and the Eastern Sayan Ridge (Republic of Buryatia, the Russian Federation). **Across the three regions in the Russian Federation, Snow leopard populations appeared to be stable, with a total of 32 Snow leopard signs being recorded and population densities ranging from 0.15 to 0.93 per 100 km².** Cross-border movement was documented, affirming the need for coordinated conservation efforts.

Habitat conditions

Habitat suitability for the Amur leopard and Amur tiger was estimated by developing a geoecological landscape classification using the socioeconomic and socioecological principles of land use. As a result, the main physical-geographical and anthropogenic factors influencing the distribution of big felids across the territory allowed for the initial compiling of a habitat map together with an assessment of the potential suitable habitat for the species.

The maximum, potential suitable habitat for the Amur leopard in the territory of the projected Sino-Russian transboundary national park “Land of Big Cats” is estimated to be about 4,114 km^2, while it is about 1,282 km^2 for the Amur tiger.

Within the Russian Federation, Snow leopards in the Eastern Sayan Ridge (Republic of Buryatia) inhabit high-altitude mountainous terrain and individuals share larger home ranges compared to other regions.

Spatial distribution and migration patterns

Amur leopards moved extensively over the state borders, with movement being observed especially in the South-Western Primorye (SWP) and the Laoyeling Tiger Landscape. The main patch of leopard distribution which provides the best habitat is still along the border with the Russian Federation in Shufan Plateau and Laoyeling mountains on an area of about 5,067 km^2.

Current data indicates that Amur tigers active in the Lesser Khingan Mountains region have migrated from the Russian Federation. About eight cross-border Amur tiger individuals are known to inhabit the Taipinggou Nature Reserve of Heilongjiang Province, located in the north-west region of the Lesser Khingan Mountains. Amur tigers in SWP have been separated from the main tiger population in the Sikhote-Alin Mountains by a development corridor between the two major cities of Vladivostok and Ussuriysk. **In China, there has been limited inland dispersal due to anthropogenic barriers, however movement was observed between Wandashan and Laoyeling regions.**

The LLNP and the NTLNP play a crucial role in the restoration of the isolated Changbaishan population of the Amur tiger, ensuring their protection across their habitat range.

Within the Russian Federation, Snow leopards in the Tsagan-Shibetu Ridge were the most mobile population. The greatest number of individuals were detected and frequent transboundary movement was recorded across the Russian-Mongolian border. In the Eastern Sayan Ridge, Snow leopards exhibited the most wide-ranging movement in terms of individual ranges and cross-border movement emphasizing the critical importance of cross-border collaboration in protecting these endangered species.

Conservation challenges

Despite progress in terms of increasing population and wider transboundary movement, these big cat species face increasing anthropogenic and biological threats, and weak regional cooperation and insufficient community engagement further hampers conservation efforts. Some of the major challenges that were identified include:

- **Poaching and illegal wildlife trade** continue to threaten populations, exacerbated by weak law enforcement and low public awareness.
- **Habitat loss and fragmentation** is caused by infrastructure development, agriculture and logging, and is worsened by lack of unified management across borders.
- **Genetic isolation** has resulted from restricted movement across fragmented landscapes which reduces gene flow, increasing vulnerability to disease and inbreeding.
- **Weak transboundary governance** due to a lack of a central coordinating body limits the ability to align goals, with no established procedure for organizing communication or cooperation.
- **Multiple national agencies with overlapping functions** create redundancies and inconsistent monitoring methods.
- **Insufficient financial support** hampers timely action and effective conservation efforts.
- **Lack of qualified staff** hinders conservation efforts due to weak technical expertise, while language barriers further impede communications and coordination efforts.

- **Restrictive visa policies** delay and restrict the movement of staff across borders, challenging transboundary conservation efforts that require joint fieldwork.
- **Limited public awareness** and community engagement reduces support for conservation initiatives.
- **Untapped tourist potential** limits opportunities for sustainable development, broader public engagement and employment possibilities.

Recent developments and strategic recommendations

Capitalizing on the extensive research and collaborative conservation efforts, in May 2024 the Russian Federation and China signed a landmark intergovernmental agreement to establish the transboundary wildlife reserve “Land of Big Cats”. The reserve, which unites the Land of the Leopard National Park and Kedrovaya Pad Nature Reserve in the Russian Federation with the Northeast Tiger and Leopard National Park in China, represents a major step forward in institutionalized conservation cooperation. The agreement is already delivering tangible results: strengthened scientific collaboration, adoption of a two-year work plan, joint ecological and cultural initiatives, and preparations for the first coordinated Amur tiger and leopard census through data-sharing from camera traps. These actions will not only enhance protection against poaching and forest fires but also raise public awareness through eco-education, youth engagement and ecotourism, creating a stronger foundation for the long-term survival of these iconic species.

Based on the research, the following strategic recommendations address the key conservation challenges and offer practical steps to guide future action and enhance regional collaboration. Together, they provide the foundation for coordinated efforts that can lead to the long-term sustainable conservation of these iconic big cat species.

- **Combat poaching and illegal wildlife trade** by implementing a SMART patrolling system, removing traps and illegal weapons, and improving joint anti-poaching protocols.
- **Curb habitat loss and boost prey populations** by identifying, unifying and protecting transboundary ecological corridors and using biotechnical measures to support ungulate populations
- **Address genetic risks** by developing transboundary corridors for free migration and exploring strategies for bloodline refreshment.
- **Enhance transboundary cooperation** by establishing a unified coordination structure, standardizing monitoring tools and sharing open-source data.
- **Consolidate multiple national agencies** by ensuring coordinated governance, removing duplication of work, streamlining operational decision-making and implementing joint monitoring and implementation programmes.
- **Increase financial support** for cooperation projects and for joint meetings with specialists.
- **Engage qualified and trained experts** by building capacity through staff exchanges, sharing of information and best practices, and developing joint training programmes.
- **Ease visa regimes** by simplifying visa and border policies.
- **Expand public outreach and education opportunities** by promoting environmental education and awareness campaigns, and involving communities through employment, youth engagement and craft initiatives.
- **Harness tourist and recreational potential** by developing nature-based tourism infrastructure and services.

Conclusion

Through extensive research and analysis of the population characteristics and spatial distribution of the Amur tiger, the Amur leopard and the Snow leopard, the project, “Transboundary Cooperation for Conservation of Amur Tigers, Amur Leopards and Snow Leopards in North-East Asia”, demonstrates that well-coordinated transboundary cooperation is critical to the survival of big cat species whose habitats span national borders.

The successful and remarkable recovery of Amur leopard and Amur tiger populations in the Sino-Russian corridor, along with the stable population of the Snow leopard, are encouraging signs of the effectiveness of transboundary cooperation and coordination. Continued investment in cross-border governance, data standardization, joint monitoring and implementation plans, as well as the sharing of knowledge, information and best practices, combined with increased community involvement through awareness-raising campaigns and sustainable tourism, will be essential for securing the future of these iconic species in North-East Asia.

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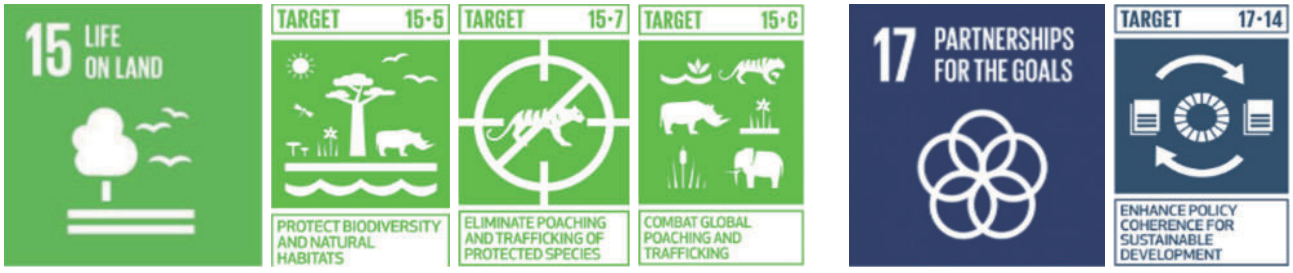
Introduction

The project, "Transboundary Cooperation for Conservation of Amur Tigers, Amur Leopards and Snow Leopards in North-East Asia", has been implemented by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) subregional office for East and North-East Asia (SOENEA), under the North-East Asian Subregional Programme for Environmental Cooperation (NEASPEC). The overarching goal of the project is to promote and institutionalize coordinated cross-border, intergovernmental cooperation mechanisms between China, Mongolia and the Russian Federation to ensure the long-term protection of these iconic big cats.

The Amur tiger, Amur leopard and Snow leopard were designated as flagship species under the NEASPEC's Nature Conservation Strategy adopted in 2007. Since this designation, NEASPEC has led several research initiatives to deepen the understanding of transboundary cooperation in the subregion. This current project builds on these NEASPEC projects and aligns with international agreements, such as the Convention on Biological Diversity (CBD), Convention on Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES).

In addition to species conservation, the project seeks to strengthen policy-making to enhance subregional coordination to address the environmental dimensions of sustainable development. Given the transboundary nature of the habitats of the Amur tigers, Amur leopards and Snow leopards, their survival depends on coordinated conservation efforts that transcend national borders.

This project also demonstrates ESCAP's commitment to adopting a comprehensive, multidimensional approach that accelerates progress on the environmental dimensions of the 2030 Agenda for Sustainable Development. It contributes directly to the achievement of the Sustainable Development Goals (SDGs), particularly SDG 15: Life on Land and its targets 15.5, 15.7 and 15.C, and SDG 17: Partnerships for the Goals and its target 17.14.



Through its support to member States, ESCAP fosters regional collaboration to safeguard critical habitats and species, and advance environmental conservation and sustainability. In this regard, the project also demonstrates ESCAP's strong focus on cooperation as outlined in the Regional Roadmap for Implementing the 2030 Agenda in Asia and the Pacific, in particular, the priority areas including: means of implementation and partnership through technology; policy coherence; North-South, South-South and international and regional partnerships; and across thematic issues such as the management of natural resources to enhance food security, conserve the environment, protect biodiversity and improve the welfare of the community.

The project focused on three main components:

Component 1. Transboundary cooperation to conserve Amur tigers and leopards between the Northeast Tiger and Leopard National Park (NTLNP) in China and the Land of the Leopard National Park (LLNP) in the Russian Federation. By assessing the population characteristics, such as species health, spatial distribution and abundance, conservation challenges and ongoing efforts related to Amur tigers and leopards, this component aims to enhance the collaboration between the two national parks and create the conditions for the establishment of a Sino-Russian Transboundary National Park (tentatively named "Land of Big Cats"), through capacity-building of government officials and local communities.

Given the significant research and collaborative efforts, in May 2024 the Russian Federation and China signed a landmark intergovernmental agreement to establish the transboundary wildlife reserve "Land of Big Cats". The agreement unites the Land of the Leopard National Park and Kedrovaya Pad Nature Reserve in the Russian Federation with the Northeast Tiger and Leopard National Park in China, marking a significant advancement in institutionalized cooperation toward transboundary conservation.

Component 2. Transboundary cooperation between protected areas in the Lesser Khingan Mountains to conserve Amur tigers. Since the Lesser Khingan Mountains serve as a key ecological corridor between China and the Russian Federation for Amur tigers, enhanced cooperation between the protected areas along the border is a critical prerequisite for their conservation. This component assesses the population status and trends of Amur tigers, and aims to strengthen the collaboration between existing transboundary protected areas. It also seeks to create an enabling environment for the establishment of a new national park in the Russian Federation and the expansion of the neighbouring protected area in China in order to safeguard the habitat for the Amur tiger in the Lesser Khingan region.

Component 3. Assessment of the current status of two Snow leopard subpopulations in the transboundary areas between Mongolia and the Russian Federation. The Snow leopard is one of the rarest and least studied species among the big cats, with a lack of exact field data on its distribution and abundance. Recent studies indicate that a few distinct, small subpopulations inhabit the Mongolian-Russian border, representing the northernmost Snow leopard subpopulations in the world, and highly isolated from the species' main range. Thus, this component aims to assess the current status and identify all individuals of Snow leopards in the transboundary areas between the Russian Federation and Mongolia by applying modern survey methodologies to improve the effectiveness of Snow leopard conservation.

Regional context, rationale and objectives of this report

The Amur tiger (*Panthera tigris altaica*) and Amur leopard (*Panthera pardus orientalis*) are endangered subspecies found in the South-Western Primorye, in the far eastern region of the Russian Federation and in the Laoyeling mountains in the north-eastern region of China. A vulnerable and rare species, the Snow leopard (Panthera uncia) inhabits the high-altitude regions of Central and South Asia, including parts of North-East Asia.

All three species face increasing threats including poaching, habitat fragmentation, inbreeding, low dispersal rates, interspecific competition and human-wildlife conflict across their range of habitat. Furthermore, weak transboundary cooperation and coordination, and poor public awareness further impact conservation efforts. These pressures underscore the urgent need for coordinated regional conservation efforts.

Under the three components of the project, extensive research was conducted to assess the current population status of Amur tigers, Amur leopards and Snow leopards, along with their habitats, ecological conditions and movement patterns. This resulted in a series of technical reports. The current report reviews all the data and literature from these reports, and consolidates the findings, assessments and documentation. Drawing on the technical reports, monitoring data and analysis conducted by the project partners and participating institutions, this report summarizes the key technical information. Its objective is to present major findings, identify challenges and provide recommendations based on the research to equip stakeholders with the necessary information to support evidence-based policymaking and facilitate transboundary conservation efforts to guide actions for the long-term conservation of the big cat species in North-East Asia.

Stakeholders involved

Given that regional cooperation for the conservation of these big cat species lies at the core of the project, a wide range of stakeholders were involved in coordination and oversight, monitoring and research activities. These included the national governments of China, Mongolia and the Russian Federation; numerous government officials; research institutions; non-governmental organizations; experts from academia and local stakeholders.

From China, key partners included the National Forestry and Grassland Administration (NFGA); the Feline Research Center of National Forestry and Grassland Administration (FRC-NFGA); and the Northeast Tiger and Leopard National Park Administration.

From Mongolia, the Academy of Sciences and the Irbis Mongolia Center NGO participated.

From the Russian Federation, partners included the Ministry of Natural Resources and Environment and the Ministry of Science and Higher Education through the Federal State Budget Institution of Science; the Pacific Institute of Geography of the Far Eastern Branch of the Russian Academy of Sciences (TIG FEB RAS) (Russian Academy of Sciences); and relevant local governments, administrations of protected areas and research institutes.

Stakeholders were actively engaged through capacity-building initiatives targeting government officials, local rangers and researchers. These included regular meetings to establish a continuous communication network, joint field work and surveys, and shared analysis to support coordinated conservation actions. Training and workshops were also conducted to improve monitoring techniques, data management and overall field capacity. Local communities were involved through awareness-raising activities, employment opportunities and educational outreach designed to strengthen local support that aligns with conservation and environment protection efforts.

Structure of the report

Chapter 1 presents the current population status of Amur tigers, Amur leopards and Snow leopards, along with an overview of their habitat conditions and movement patterns across the region. Chapter 2 identifies the major challenges and threats facing big cat populations. Based on the identified challenges, Chapter 3 provides strategic recommendations and actionable guidance for improving big cat populations, enhancing conservation efforts and fostering transboundary cooperation.

1 Key findings

1.1 Methods for Collecting Data

In order to assess the current population status of Amur tigers, Amur leopards and Snow leopards, their habitats and ecological conditions, and movement patterns, the project undertook several key activities to collect data. These activities were coordinated and conducted under the oversight of the respective governments and the relevant ministries, and were led by fieldworkers and researchers from the national parks, scientific institutions and local experts.

The project began by developing a unified classification and mapping of habitats using GIS and remote sensing technologies. A spatial database and cartographic base were created to support joint conservation planning and monitoring efforts. The project used a combination of data sources and tools, including remote sensing data from Landsat, Sentinel, MODIS, ALOS; OpenStreetMap for administrative boundaries and infrastructure; digital elevation models and water body datasets; and cartographic and GIS software, such as ArcGIS Pro and ArcMap. Camera traps were also installed to identify individual animals. Land use and habitat types were systematically classified in a number of categories, including forests, meadows, shrubs, water bodies, cultivated fields, built-up land, and rice fields. In addition, a modern land-use map was created for the region to identify and classify habitats suitable for big cats. Forest types were also subdivided to determine habitat suitability for species. The resulting maps and spatial data provided the foundation for ongoing monitoring, management and restoration of big cat populations.

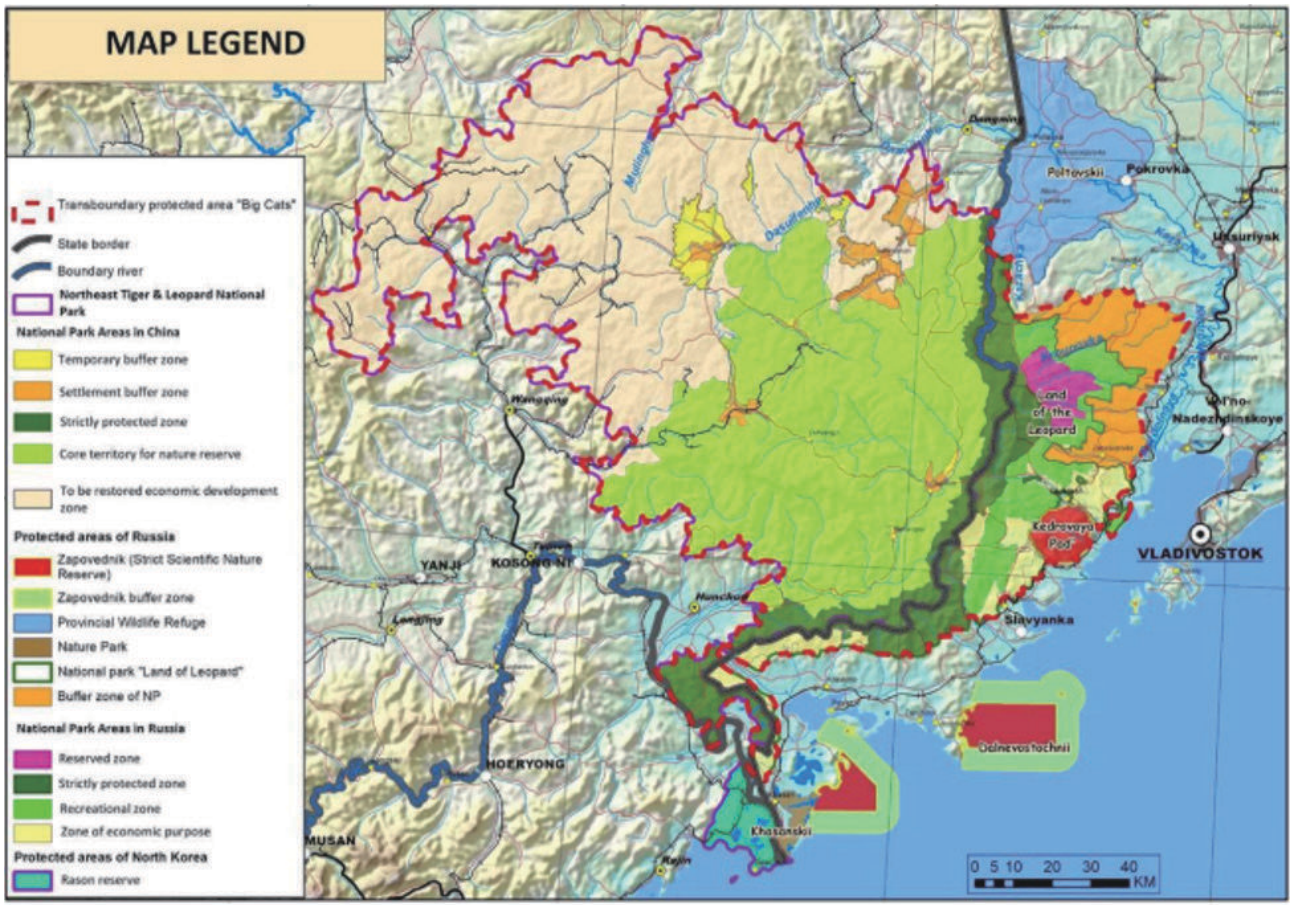
1.2 Population Characteristics

To facilitate transboundary cooperation for the conservation of the big cat species, the project focused on assessing population characteristics, habitat conditions and movement patterns. Components 1 and 2 examined the status of the Amur leopard and Amur tiger, while Component 3 focused on Snow leopards inhabiting the transboundary region of the Russian Federation and Mongolia. These assessments provided a scientific basis for joint conservation planning and collaboration.

Component 1 of the project encompassed the Northeast Tiger and Leopard National Park (NTLNP) in China and the Land of the Leopard National Park (LLNP) in the Russian Federation. It also explored the conditions for the creation of a Sino-Russian Transboundary National Park (tentatively named “Land of Big Cats”), which could cover a vast territory of about 18,000 km^2 and serve as a future habitat for hundreds of tigers and leopards (Figure 1).

The proposed territory of the “Land of Big Cats” consists of two transboundary areas: (1) the SWP from the Razdolnaya River to the Tumannaya River (about 3,705 km^2), including the Kedrovaya Pad State Nature Reserve, the Land of the Leopard National Park with clusters and its buffer zone; (2) the Yanbian County in the north-eastern part of Jilin Province and the south-eastern part of Heilongjiang Province, including the basin of the Razdolnaya River - the territory of the Northeast Tiger and Leopard National Park, and adjacent territories (14,407 km^2).

Figure 1. Proposed cross-border reserve for "Land of Big Cats"



Data source: NEASPEC Project report

Component 2 assessed the population characteristics of the Amur tigers in the protected areas in the Lesser Khingan Mountains, while Component 3 involved identifying and assessing the current status of all individual Snow leopards along the Russian-Mongolian border areas.

To estimate the species populations' annual density and abundance, a spatially explicit capture-recapture (SECR) modelling approach was used. For each year, two parameters were estimated: the number of individuals captured during the survey period (to define the number in a demographically "closed" population) and the total number of individuals in a biological year from 1 November to 31 October of the next year (demographically open population). Data from the biological year were used to evaluate population characteristics. Of course, considerations of changes in structure of the population – individuals are born and die, migrate, change states (cubs become independent and disperse) were also taken into account.

The Amur tiger and Amur leopard share a small transboundary range along the border of China and the Russian Federation. These populations represent the sole source of subspecies recovery in the Changbaishan ecoregion in China, with the Laoyeling Tiger Landscape being identified as a top priority region for restoration. Conservation of both species requires joint action by the Russian Federation and China to sustain populations and protect their habitats (Table 1).

Table 1. Geographic distribution and conservation context of Amur tigers and Amur leopards

	Amur tiger	Amur leopard	Shared context
Current range	Land of the Leopard National Park (LLNP), near the China border	Confined to the south-western Primorye (SWP), the Russian Federation	Geographic ranges of the two subspecies overlap in this small transboundary region
Range in China	Present in North-East China, including the Changbaishan ecoregion	Present in the bordering areas of Jilin and Heilongjiang Provinces in China	Both are found in the Changbaishan ecoregion in the Laoyeling Tiger Landscape (LTL), a key restoration zone in China
Priority landscape for subspecies recovery	Sole source for subspecies recovery in Changbaishan ecoregion, specifically the Laoyeling Tiger Landscape (LTL)	Sole source for subspecies recovery in Changbaishan ecoregion, specifically the Laoyeling Tiger Landscape (LTL)	Shared restoration target and landscape for both species
Responsibility for conservation	China and the Russian Federation	China and the Russian Federation	Joint implementation actions aimed at sustaining Amur tiger and leopard populations and preserving their habitat

Monitoring and implementation of activities conducted under Components 1 and 2, aimed at assessing the populations of the Amur tiger and Amur leopard, were managed by the Ministry of Science and Higher Education, and the Ministry of Natural Resources and Environment of the Russian Federation, through the Federal State Budget Institution of Science. The Pacific Institute of Geography of the Far Eastern Branch of the Russian Academy of Sciences (TIG FEB RAS) also contributed significantly to these efforts. From the Chinese side, monitoring and implementation, particularly under Component 2, were carried out by the Feline Research Center of National Forestry and Grassland Administration (FRC-NFGA), College of Wildlife and Protected Area, Northeast Forestry University, Harbin.

1.2.1 Amur Leopard

In the South-Western Primorye (SWP), 53 leopards were recorded in 2014. Following successful conservation efforts, the numbers increased to 111 individuals, marking a little more than a doubling of the populations (Table 2). The following are the results of data collection for the Amur leopard in the SWP in the Russian Federation and in the Laoyeling Tiger Landscape in China.

Table 2. Population characteristics for the Amur (Far Eastern) leopard in SWP in the Russian Federation

Estimated number of individuals in the biological year (1 November – 31 October)	2014	2015	2016	2017	2018	2019	2020	2021
Male independent	26	25	23	31	36	36	33	50
Female independent	33	34	34	49	60	62	65	65**
Independent (unknown sex)	1	1	2	5	10	7	17	30
Independent total	60	60	59	85	106	105	115	145
Cubs	11	10	18	15	22	12	16	13
Total	**71**	**70**	**77**	**100**	**128**	**117**	**131**	**158**
Sex ratio (F/1M)	1.27	1.36	1.48	1.58	1.67	1.72	1.97	1.30
Density (individuals/100km^2)	0.89	0.92		1.18	1.36		1.67	1.76+/- 0.08
Estimated number of individuals in the survey period (90 days between January – May)	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**

Male independent	21	21	21	28	31	32	29	43
Female independent	25	26	25	35	48	42	45	49*
Independent (unknown sex)	0	1	1	1	5	4	11	12
Independent total	46	48	47	64	84	78	85	104
Cubs	7	8	8	11	14	8	5	7
Total	**53**	**56**	**55**	**75**	**98**	**86**	**90**	**111**
Sex ratio (F/1M)	1.19	1.24	1.19	1.25	1.55	1.31	1.55	1.14

Note:
** 4 females (8.2%) were with litters, 2 or more cubs registered without mothers*
*** 9 females (13.8%) were with litters, 2 or more cubs registered without mothers*

With 12 independent leopards being recorded in 2013, in the Laoyeling Tiger Landscape, the number increased to 60 individuals by 2020, marking a five-time increase in populations (Table 3).

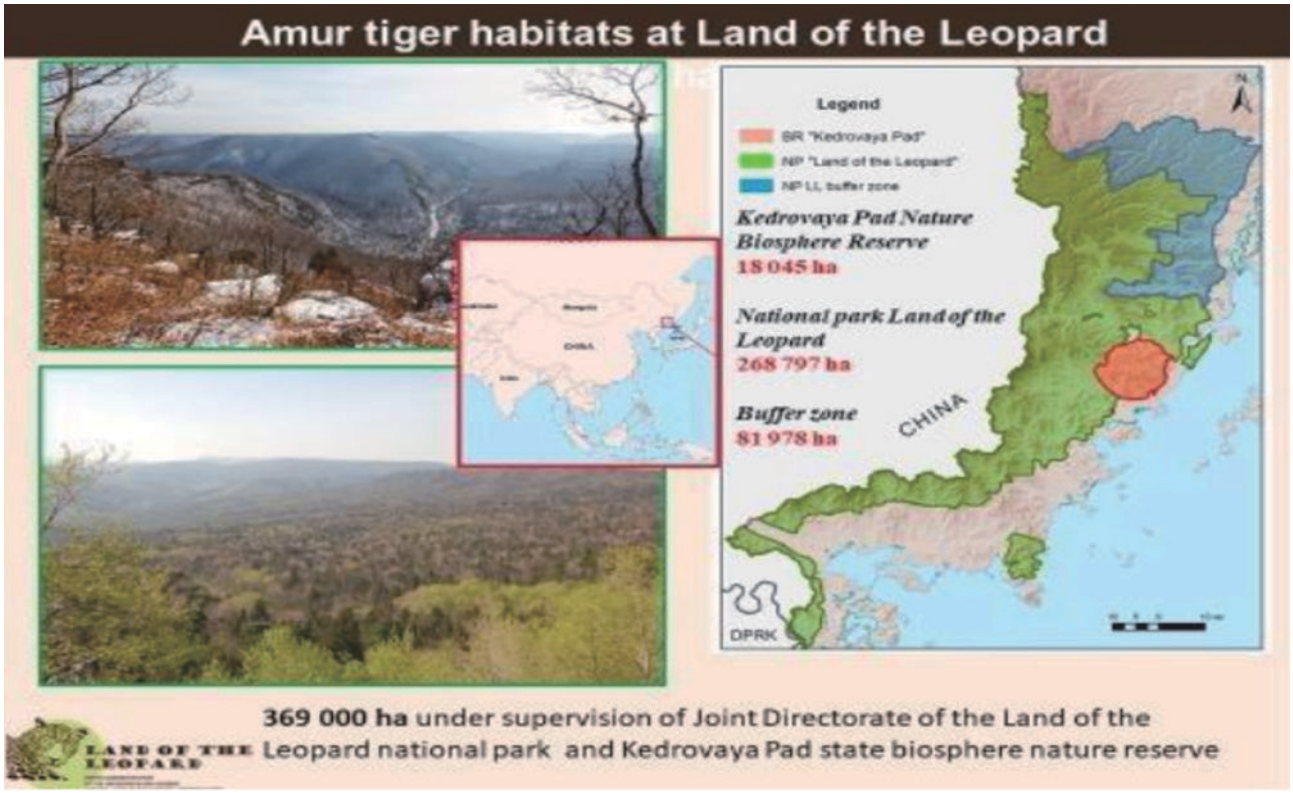
Table 3. Population characteristics for the Amur (Far Eastern) leopard in the Laoyeling Tiger Landscape in China (based on camera trap monitoring)

Individual leopard	2013	2014	2015	2016	2017	2018	2019	2020
Male independent	5	8	11	13	15	18		
Female independent	4	8	8	10	17	21		
Independent (unknown sex)	1	0	1	1	6	9		
Independent total	10	16	20	24	38	48	49	53
Cubs	2	2	1	2	5	4	0	7
Sex ratio (F/1M)	0.8	1	0.73	0.78	1.13	1.17	0.94	
Total	**12**	**18**	**21**	**26**	**43**	**52**	**49**	**60**

1.2.2 Amur Tiger

Following are the results of data collection for the Amur tiger in the SWP in the Russian Federation and in the Laoyeling Tiger Landscape in China.

Figure 2. Habitat of the Amur tiger in the Land of the Leopard



In the South-Western Primorye (SWP), the population of the Amur tiger doubled from 30 individuals in 2014 to 60 in 2021 during the 90-day survey period (Table 4).

Table 4. Population characteristics for the Amur tiger in SWP in the Russian Federation

Estimated number of individuals in the biological year (1 November – 31 October)	2014	2015	2016	2017	2018	2019	2020	2021
Male independent	9	13	8	8	10	11	14	24
Female independent	13	14	13	16	23	24	29	36
Independent (unknown sex)	0	1	0	1	4	3	4	2
Independent total	22	28	21	25	37	38	47	62
Cubs	13	3	7	10	16	13	18	18 (24)
Total	**35**	**31**	**28**	**35**	**53**	**51**	**65**	**80**
Sex ratio (F/1M)	1.44	1.08	1.63	2.00	2.30	2.18	2.07	1.50
Estimated number of individuals in the survey period (90 days between January – May)	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Male independent	8	12	8	7	10	11	12	18
Female independent	11	13	10	15	20	21	24	30
Independent (unknown sex)	0	1	0	0	2	2	3	1
Independent total	19	26	18	22	32	34	39	49
Cubs	11	1	1	8	13	12	15	11
Total	**30**	**27**	**19**	**30**	**45**	**46**	**54**	**60**
Sex ratio (F/1M)	1.38	1.08	1.25	2.14	2.00	1.91	2.00	1.67

In the Laoyeling Tiger Landscape, the population of the Amur tiger increased significantly from 7 individuals in 2013 to 50 in 2020 (Table 5).

Table 5. Population characteristics for the Amur tiger in Laoyeling Tiger Landscape in China (based on camera trap monitoring)

Individual tiger	2013	2014	2015	2016	2017	2018	2019	2020
Independent total	7	16	12	11	13	18	26	40
Cubs	0	6	1	5	7	11	3	10
Total	**7**	**22**	**13**	**16**	**20**	**29**	**29**	**50**

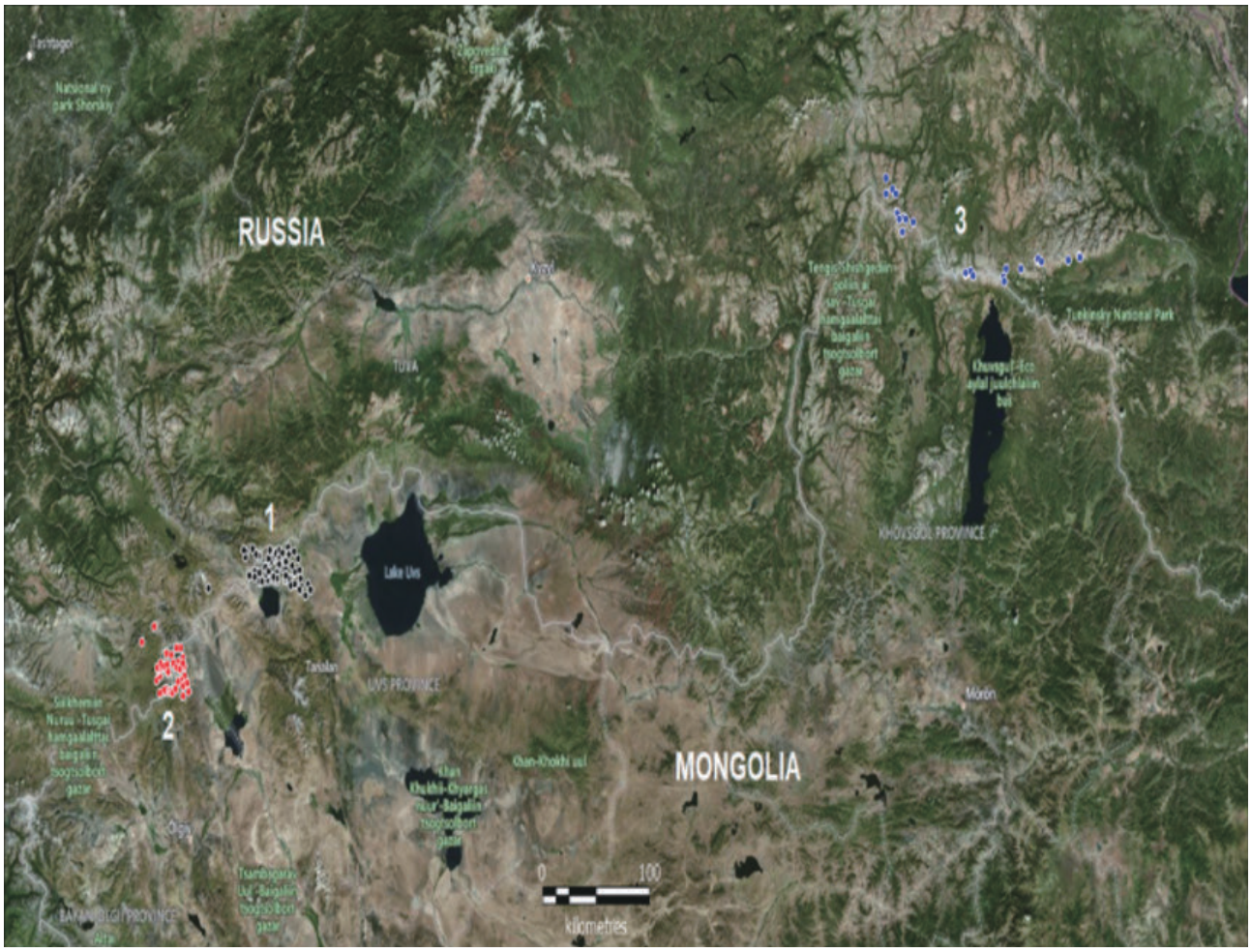
Amur tigers were successfully reintroduced in the Russian Jewish Autonomous Prefecture, which is adjacent to the Lesser Khingan Mountains, after the population became extinct in the 1960s – 1970s. Following this success, there has been frequent monitoring of the tiger since 2014 using infrared cameras. As a result, a stable population of the Amur tiger has been established in the region. Since 2014, at least eight wild Amur tigers have been consistently active, as observed through camera monitoring and footprint identification. In 2021, the female tiger “Lazovka” and her cubs were frequently detected in this area. This indicates that the Lesser Khingan Mountains region has potential for the recovery of the Amur tiger population in China. Simultaneously, the reserves in the Lesser Khingan Mountains region that border the Russian Federation are also crucial for establishing transboundary protection areas for the species.

1.2.3 Snow Leopard

Snow leopard monitoring across the transboundary region between the Russian Federation and Mongolia was conducted under Component 3 of the project "Transboundary Cooperation for Conservation of Amur Tigers, Amur Leopards and Snow Leopards in North-East Asia".

In the Russian Federation, monitoring was conducted across three landscapes: the Tsagan-Shibetu (Tuva, the Russian Federation and Tsagaan-Shuvuut, Mongolia); the Chikhachev Ridge (Republic of Altai, the Russian Federation and Mongolia); and the Eastern Sayan Ridge (Republic of Buryatia, the Russian Federation) (Figure 3). Monitoring was conducted across two expeditions which covered a total of 720 km of survey routes.

Figure 3. Transboundary monitoring sites in the Russian Federation



Note: Red – Chikhachev ridge; Black – Tsagan-Shibetu ridge; Blue – Eastern Sayan ridge

Across the three regions in the Russian Federation, a total of 32 Snow leopard signs were recorded, which included faeces, scrapes and footprints, and 8 DNA samples were collected for further analysis.

The following are the results of data collection for Snow leopard monitoring.

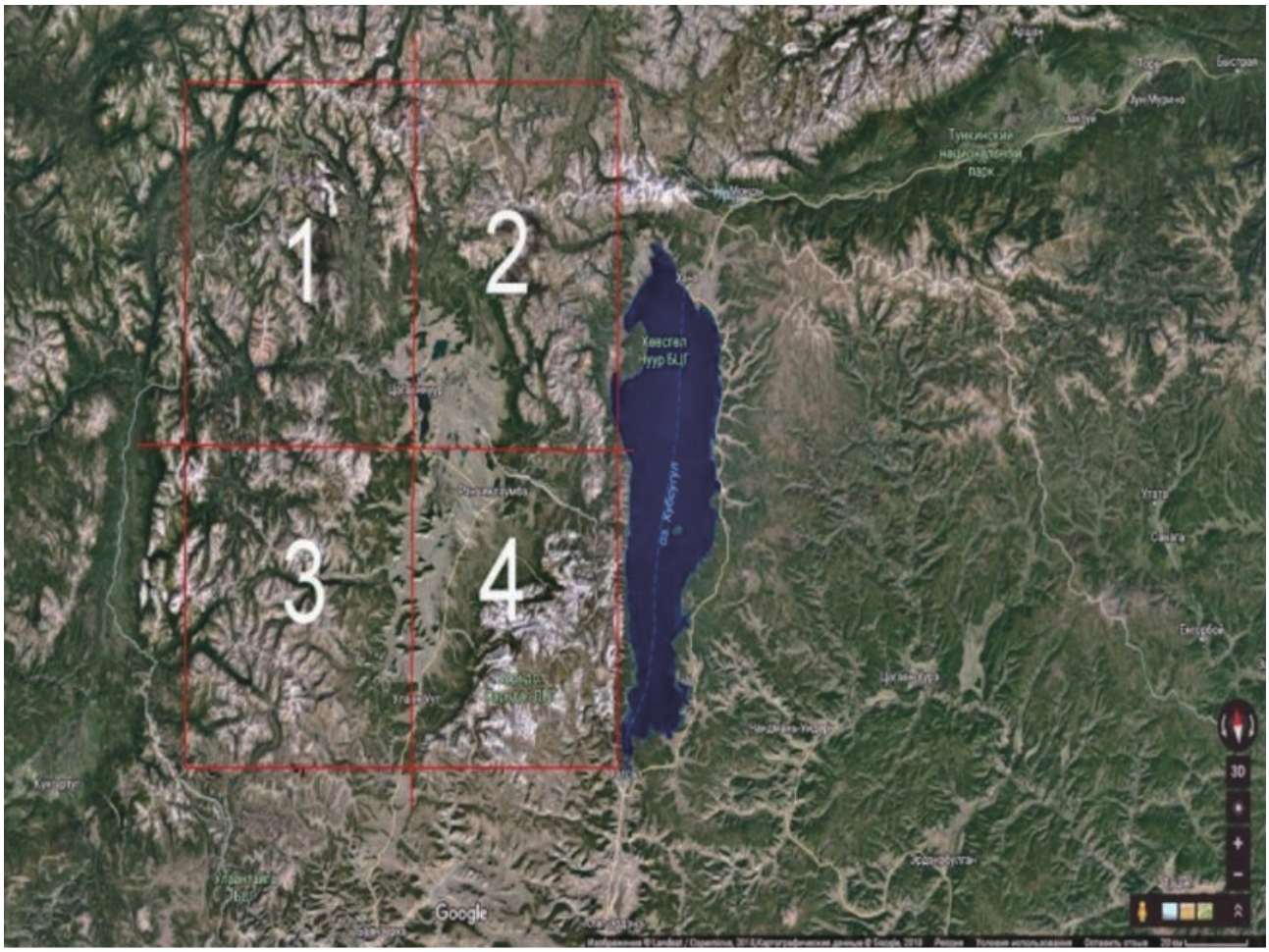
Table 6. Population characteristics for the Snow leopard across three regions along the Russian Federation and Mongolian transboundary landscape, 2020-2021

Region	Year	Individuals identified	Density (individuals/100km^2)
Tsagan-Shibetu	2020-2021	Final analysis pending*	Information pending
Chikhachev	2020	5**	0.18+/- 0.03
Eastern Sayan	2020	5-6 confirmed***	0.04+/-0.01

** Data from Mongolia cameras delayed due to COVID-19 and weather conditions.*
*** Data from Mongolia is pending.*
**** Estimates are expected to increase once data from Mongolia is added.*

In Mongolia, the Irbis Mongolia Center NGO was the implementing agency and monitoring was conducted using camera traps in the Siilkhem B National Park in Bayan-Olgii Province and the Khuvsugul mountain range in Khuvsugul Province (Figure 4).

Figure 4. The mountain ranges, potential habitat of Snow leopards in Khuvsugul Province



Note: 1) Shishhid plateau and Ikh Sayan mountain range; 2) Sayan and peak Munkh Saridag in Eastern Sayan mountain range; 3) Ulaan taiga protected area; 4) Khoridol Saridag protected area

In the Siilkhem B National Park that encompasses an area of 778.79 km^2, approximately 47 camera traps were installed (Figure 5). A total of 42 signs of Snow leopards were recorded, including faeces, scrapes and claw rakes on trees.

Figure 5. Camera traps in Siilkhem B National Park

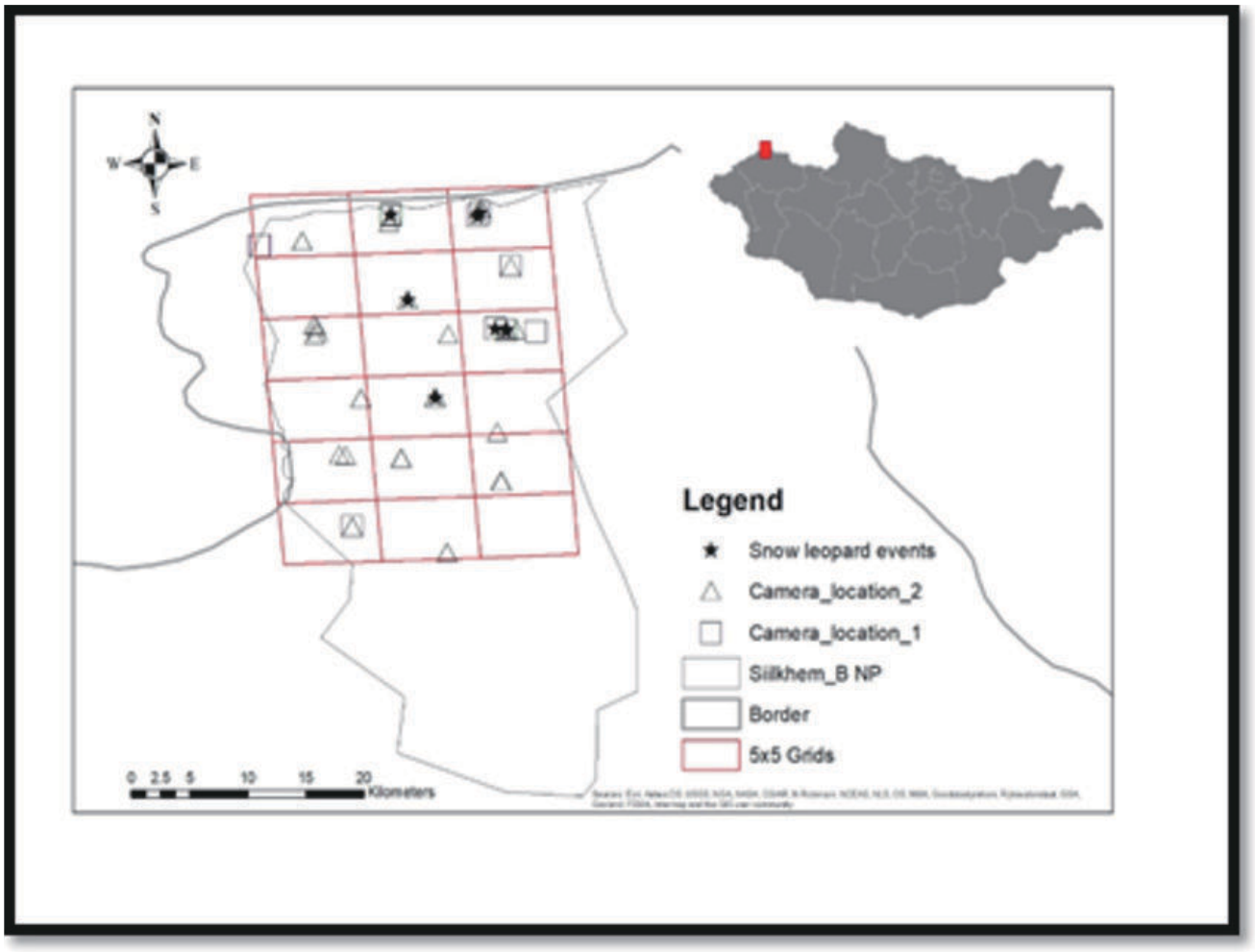


Table 7. Results of camera trap surveys in the Siilkhem B National Park

Sampling period	No. of camera traps	No. of Snow leopards recorded
28 July 2020 – 12 November 2020	34*	7
12 January 2021 – 19 March 2021	12	9 + 2 cubs

*Note: * One camera trap did not collect data due to bad road and snow conditions*

Overall, the Snow leopard population in Siilkhem B National Park appears to be stable overall, with signs of a slight increase as compared to previous assessments. New and statistically valid data were also obtained on the population status of Snow leopards, revealing that the population density across different areas of the reserve ranged from 0.15 to 0.93 individuals per 100 km², indicating a strong need for increased conservation efforts.

During fieldwork in the Khoridol Saridag mountain range, researchers registered four instances of Snow leopard faeces (both old and fresh, estimated to be 6–12 months old), as well as fresh scrape marks and scent-marking sites at two locations.

Additionally, camera traps placed in Ulaan Taiga Strictly Prohibited Area (SPA) did not capture any photographic or video evidence of Snow leopards. However, partners shared video footage of a Snow leopard recorded during surveys in 2020. These surveys documented two individual Snow leopards in the Eastern Sayan Mountain Range, located in the Russian–Mongolian border region.

1.3 Habitat Conditions

Habitat suitability for the Sino-Russian population of the Amur tiger and Amur leopard was estimated by developing a geoecological landscape classification using the socioeconomic and socioecological principles of land use. Landscapes were divided into natural and anthropogenic types, with ten key land categories identified as relevant to big cat habitats, including forests, meadows and agricultural areas, among others. These were further refined into detailed classifications, including for example, anthropogenically modified areas, water bodies and forest types. As a result, the main physical-geographical and anthropogenic factors influencing the distribution of big felids across the territory enabled the initial compilation of a habitat map (Figure 6 and Figure 7).

1.3.1 Amur Leopard

Currently, the Amur leopard occupies about 5,300 km^2 of suitable habitat in SWP with nearly full coverage of the land area, while in China it inhabits about 8,625 km^2.

Figure 6. Potential habitat for the Amur leopard in the territory of the projected Sino-Russian transboundary reserve "Land of Big Cats"

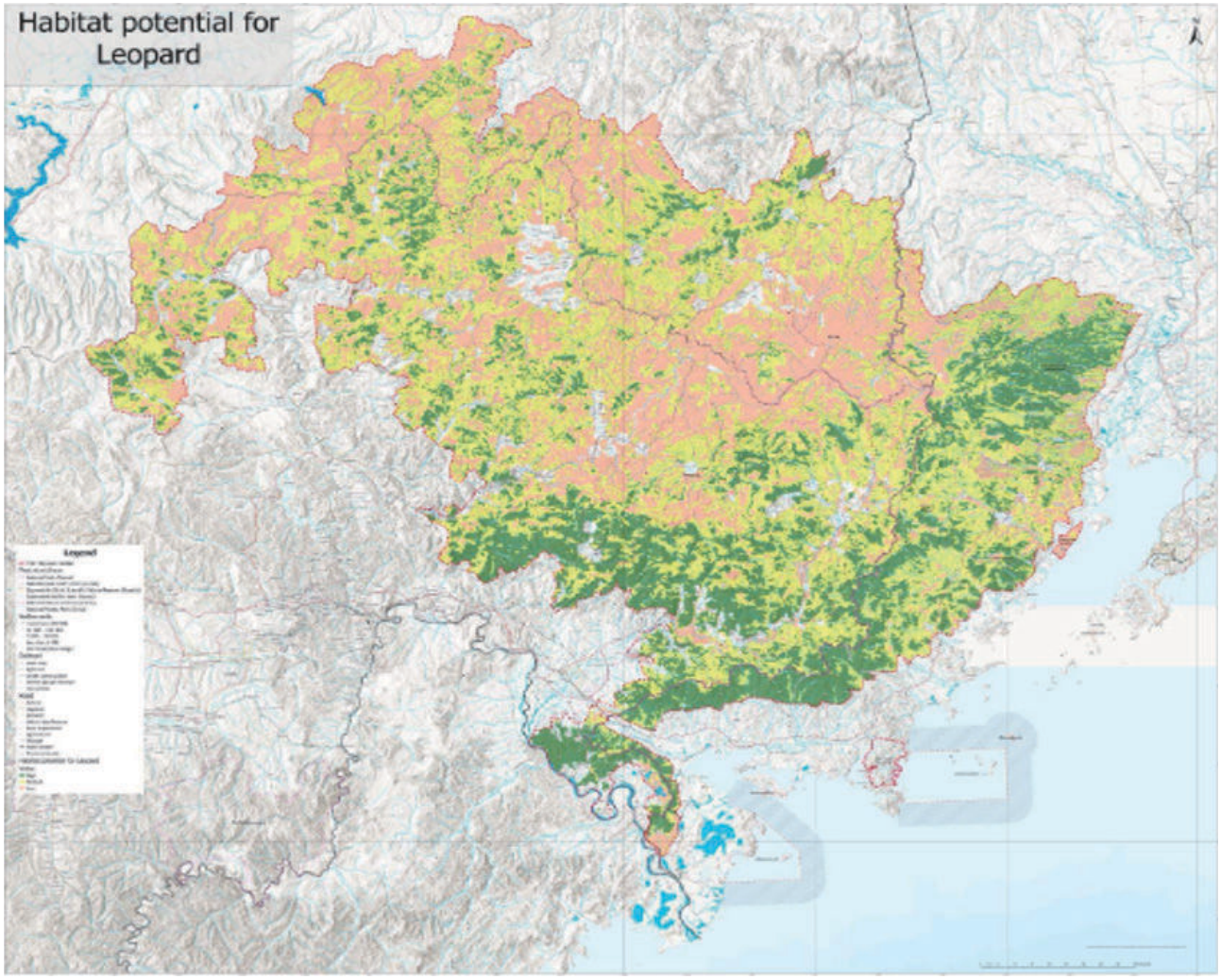


Table 8. Potential habitat suitability for the Amur leopard in the territory of the projected Sino-Russian transboundary national park "Land of Big Cats"

National Park	Total area (km^2)	Not suitable (km^2)	Minimum suitable (km^2)	Medium suitable (km^2)	Maximum suitable (km^2)
Land of the Leopard, the Russian Federation	3,705	129	619	1,532	1,425
Northeast Tiger and Leopard National Park, China	14,838	1,175	5,051	5,923	2,689
Total	**18,543**	**1,304**	**5,670**	**7,455**	**4,114**

1.3.2 Amur Tiger

Figure 7. Potential habitat for the Amur tiger in the territory of the projected transboundary reserve "Land of Big Cats"

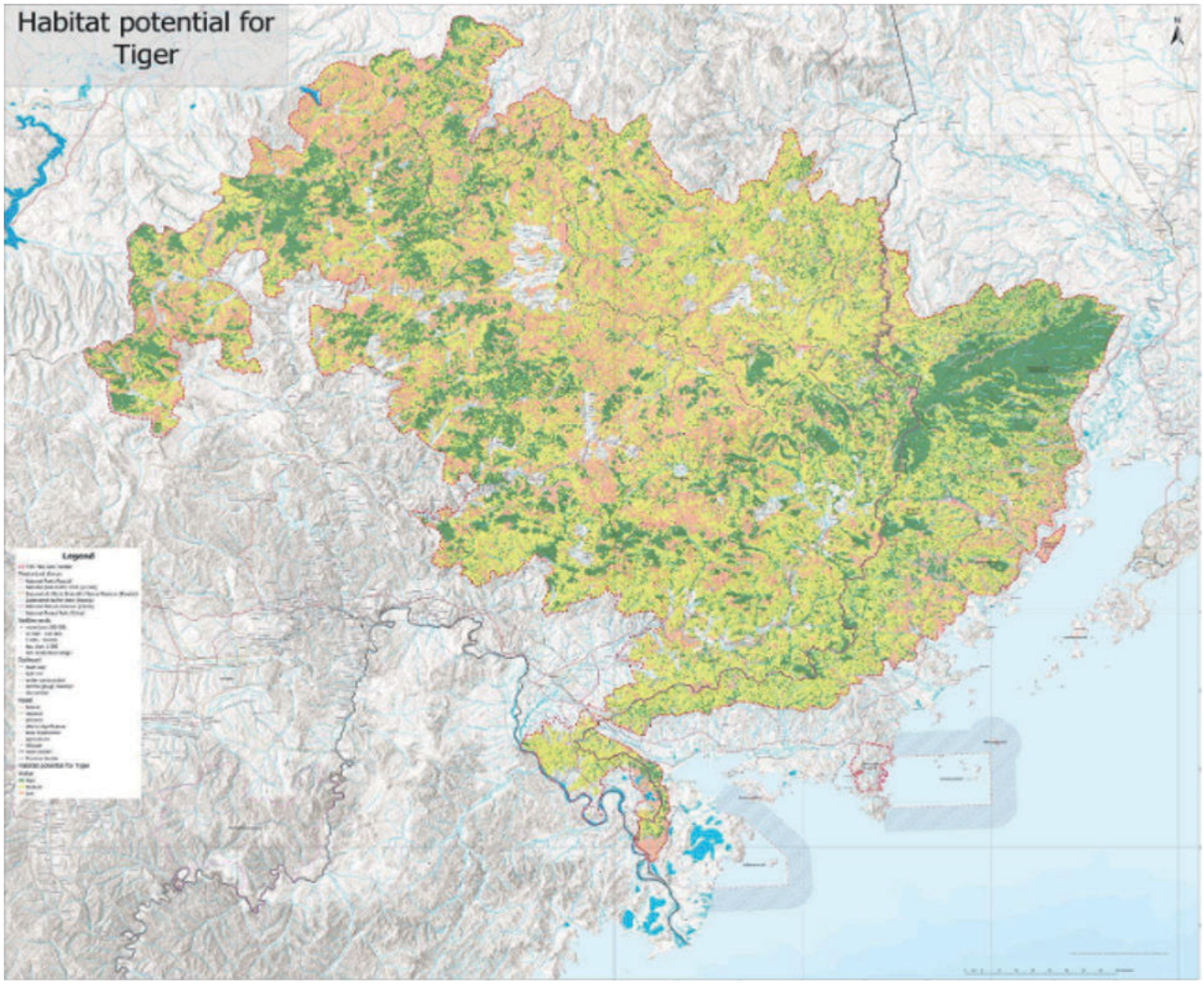


Table 9. Potential habitat suitability for the Amur tiger in the territory of the projected Sino-Russian transboundary protected area "Land of Big Cats"

National Park	Total area (km^2)	Not suitable (km^2)	Minimum suitable (km^2)	Medium suitable (km^2)	Maximum suitable (km^2)
Land of the Leopard, the Russian Federation	3,706	612	1,761	1,207	126
Northeast Tiger and Leopard National Park, China	14,837	3,768	6,950	2,963	1,156
Total	**18,543**	**4,380**	**8,711**	**4,170**	**1,282**

1.3.3 Snow Leopard

Within the Russian Federation, Snow leopards in the Eastern Sayan Ridge (Republic of Buryatia) inhabit high-altitude mountainous terrain and individuals share larger home ranges compared to other regions. Key prey species include ibex, red deer and wolverines. The Chikhachev Ridge (Republic of Altai) features alpine and subalpine habitats. Here, Snow leopard home ranges are smaller, covering about 250 km^2, and some individuals (such as the male named Khorgay and the female, Guta with 3 cubs) have been monitored for about 7 years at this site.

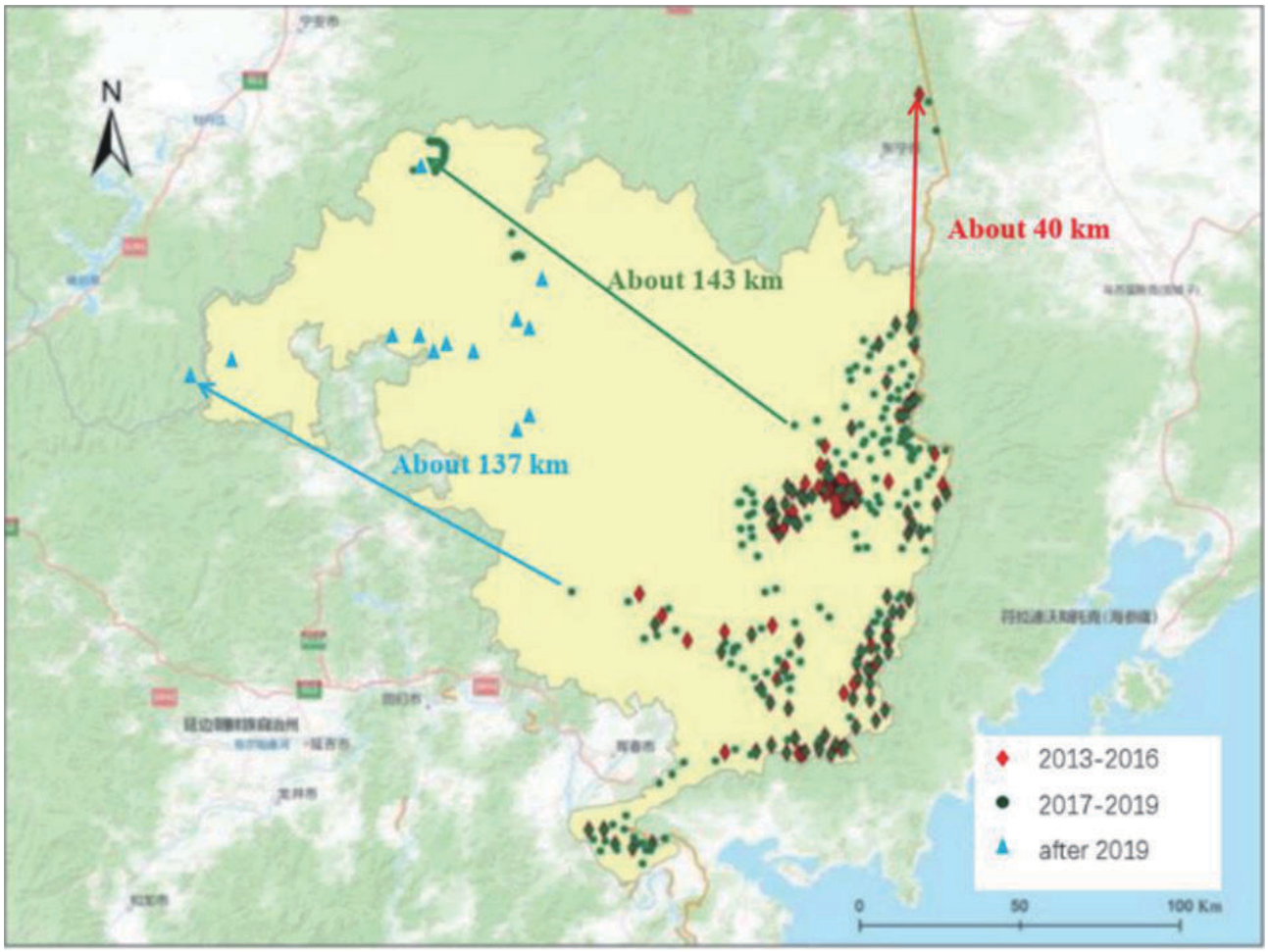
1.4 Spatial Distribution and Migration Patterns

As part of Component 1 of the project, spatial distribution was assessed by creating a geodatabase and developing electronic topographic information layers using ArcGIS Pro 2.8. Extensive camera trap surveys across the entire monitoring network were used to estimate populations, gender, adults and litters. Research on the migration patterns of Amur leopards and Amur tigers was conducted through camera trap data and genetic analysis.

1.4.1 Amur Leopard

It was found that Amur leopards moved extensively across the state borders. In previous years, in the SWP, sub-adult males have also spread 70 km to the north and 60 km to the east, crossing large belts of agricultural lands, railroads and highways. Approximately 20 per cent of leopards were photographed on both sides of the Sino-Russian border. Movement was observed especially in SWP and Laoyeling, indicating extensive transboundary movement. The main patch of leopard distribution which provides the best habitat is still along the border with the Russian Federation in the Shufan Plateau and Laoyeling Mountains, covering an area of about 5,067 km^2. Currently, the leopards inhabit most of the territory in Hunchun and Wangqing municipalities and have moved 137-143 km deeper into north-west China.

Figure 8. Registrations of leopards at different monitoring stations in the Laoyeling Tiger Landscape China

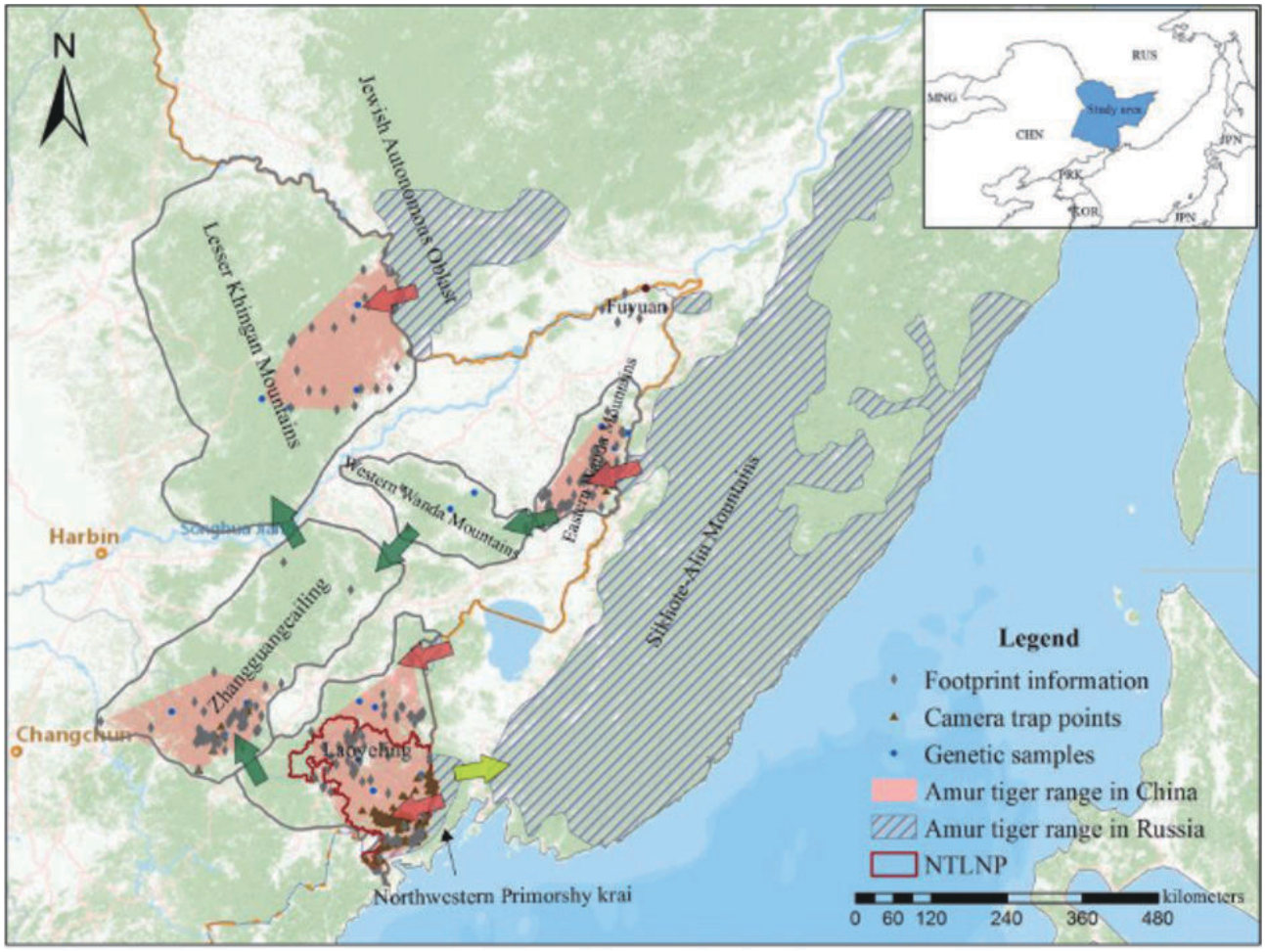


1.4.2 Amur Tiger

Amur tiger populations were investigated both under Component 1 and Component 2 of the project. As part of Component 2, surveys were conducted in the Lesser Khingan Mountains using the line transect method. This forested area covers a range of about 73,440 km^2, with a total sampling area of 21,600 km^2 representing 30 per cent of the total area. Current data, collected through footprints, witnesses, faeces collection and camera traps, indicate that Amur tigers active in the Lesser Khingan Mountains region have migrated from the Russian Federation. About eight cross-border Amur tiger individuals are known to inhabit the Taipinggou Nature Reserve of Heilongjiang Province, located in the north-west region of the Lesser Khingan Mountains.

Amur tigers in SWP have been separated from the main tiger population in the Sikhote-Alin Mountains by a development corridor between the two major cities of Vladivostok and Ussuriysk. In China, there has been limited inland dispersal due to anthropogenic barriers, however movement was observed between the Wandashan and Laoyeling regions.

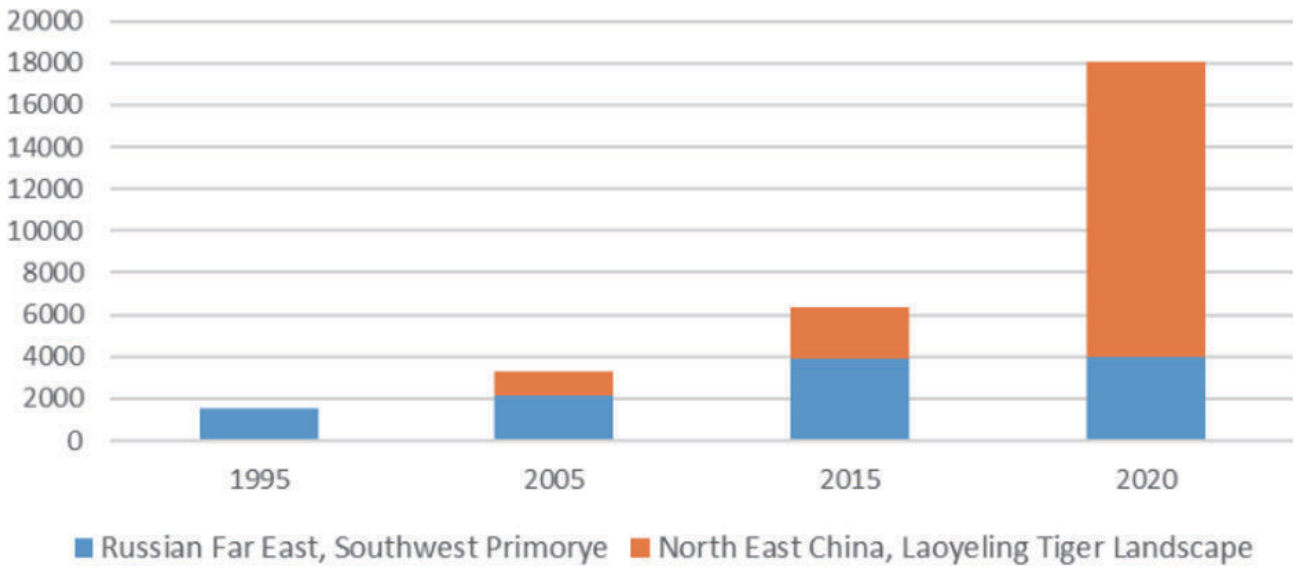
Figure 9. Tiger observations collected in 2013-2018 and connection between different tiger landscapes in North-East China and the Russian Far East



The LLNP and the NTLNP play a crucial role in the restoration of the isolated Changbaishan population of the Amur tiger, ensuring their protection across their habitat range. All animals of the Changbaishan population were registered in Jilin Province in China, mostly along the 270 km border with the Russian Federation. It was found that, out of 45 tigers, 19 individuals crossed the border, with an equal rate for males and females. The home ranges for most of the tigers were located just along the Sino-Russian border, but some tigers were found to have moved far west to inner China.

In summary, in-depth research, focused monitoring and continued transboundary cooperation have resulted in a significant overall increase in both the Amur leopard and Amur tiger populations across the Sino-Russian corridor (Figure 10).

Figure 10. Development of protected areas for conservation of the Amur leopard and the Changbaishan population of the Amur tiger across the Sino-Russian transboundary region (km^2)



This Sino-Russian region functions as a critical transboundary movement corridor, with both species crossing and utilizing protected areas in both countries. These findings underscore the importance of sustained transboundary cooperation to ensure further conservation and protection of these big cat species.

1.4.3 Snow Leopard

Within the Russian Federation, Snow leopards in the Tsagan-Shibetu Ridge were the most mobile population, with frequent transboundary movement being recorded across the Russian-Mongolian border. In comparison, leopards in the Tsagan-Tsibetu and Chikhachev Ridge were half as mobile. Movement patterns in 2020 appear to have been impacted by harsh winters, prompting migration to Mongolia.

In the Eastern Sayan Ridge, Snow leopards exhibited the most wide-ranging movement in terms of individual ranges and cross-border movement. For example, two males, Munko and Champion, were initially recorded on the Russian side of the Eastern Sayan Ridge in 2020, and were later photographed on the Mongolian slopes of the Eastern Sayan Ridge. This was the first photographic evidence of cross-border movement between Russia and Mongolia for these individuals.

In summary, the highest number of Snow leopards were detected near the Mongolia-Russia border, with a number of individuals registering transboundary movements, emphasizing the critical importance of cross-border collaboration in protecting these endangered species. However, despite the increase in population and registered transboundary movement patterns, several conservation challenges remain that must be addressed to secure the long-term survival of the Amur leopard, the Amur tiger and Snow leopard species across their habitat range.

2 Conservation Challenges

Big cat populations, such as the Amur leopard, the Amur tiger and the Snow leopard, face a range of threats that jeopardize their survival. In protected areas, such as national parks and reserves, the situation is notably more favourable, with robust safeguards ensuring minimal anthropogenic pressures and supporting population stability. Nonetheless, given their endangered status, these species are particularly vulnerable. Research conducted through the project sheds light on a number of anthropogenic and biological challenges, which include poaching, habitat fragmentation and genetic isolation. Additionally, the lack of strong transboundary cooperation and effective coordination, as well as a lack of public awareness and tourism, further hinders conservation efforts.

2.1 Anthropogenic and Biological Threats

Poaching remains a serious and persistent threat across all three species. Tigers and leopards are illegally hunted for their body parts, given their high demand in traditional medicine and luxury markets. With their predictable movement patterns, Snow leopards are easy targets for poachers and are also killed by herders as they seek out livestock.

Inadequate enforcement of wildlife protection laws, due to weak legal frameworks, low conviction rates and limited awareness among authorities, undermines efforts to curb poaching and the illegal wildlife trade.

Additionally, the lack of sufficient human resources and limited use of standardized monitoring tools hampers effective patrolling and surveillance, making it challenging to detect and prevent illegal activities, as snares, nooses, traps and illegal weapons are still found across habitats. Furthermore, bilateral monitoring and patrolling efforts remain inconsistent, with a lack of structured coordination on anti-poaching methods.

Habitat loss due to expanding settlements, logging, infrastructure development and agricultural fires has significantly reduced the availability of suitable territory and natural prey. In areas where natural prey is scarce, leopards and Snow leopards turn to livestock, increasing human-wildlife conflict.

Overhunting of ungulates like red deer, wild boar and goats by local communities, as well as for trophy hunting, reduces the food base for large carnivores. Prey base recovery efforts, such as biotechnical measures like mineral licks or winter feeding of wild ungulates, are limited, which also leads to instability in the food supply for large carnivores.

Habitat fragmentation and fencing along borders further isolate populations and disrupt natural migration and breeding patterns, especially in Snow leopard ranges. Such disconnected landscapes prevent the formation of ecological corridors, which are essential for species movement and genetic exchange. As population densities rise in restricted areas, interspecific competition among sympatric carnivores can become acute.

Additionally, fragmented data collection methods and surveillance, along with uncoordinated efforts across protected areas in the transboundary region to restore and reconnect habitats, hamper large-scale ecosystem recovery. The lack of joint environmental assessments and standardized land-use monitoring also impedes efforts to protect critical habitats from future degradation.

Genetic isolation, low reproductive rates and inbreeding pose serious threats to the population of the big cat species. The absence of transboundary corridors limits movement and prevent critical genetic exchange. Therefore, small populations with limited gene flow, result in reduced fertility, lower survival rates for cubs and increased vulnerability to diseases.

These challenges are compounded by limited measures to refresh bloodlines and boost genetic diversity. Such a decline in genetic health not only weakens population resilience but also undermines long-term recovery efforts for isolated populations.

2.2 Lack of Transboundary Cooperation and Coordination

Weak transboundary coordination impacts conservation efforts, as working within national boundaries creates numerous challenges. There is limited real interaction between the departments responsible for conservation across the Russian Federation and China, which has led to formal meetings but resulted in limited substantial outcomes. The absence of a central coordinating body compounds the issue, impacting joint planning and implementation of conservation efforts.

Additionally, the lack of a strong cross-border network between Russian and Chinese protected areas and their respective personnel limits the ability to align goals, with no established procedure for organizing communication or cooperation between the protected areas in the two countries.

Multiple national agencies with overlapping functions also restrict efficient operational decision-making and monitoring, creating complexity and inefficiency in coordinating conservation efforts across transboundary protected areas. Such redundancies result in fragmented governance, delays, inefficiencies, inconsistent monitoring and timely actions. While some Russian and Chinese protected areas have successfully conducted cross-border monitoring and inventory, nevertheless, inconsistent methodologies, as well as the lack of a single coordinator to ensure coordinated work across borders, hamper effective cooperation.

Without streamlined decision-making and joint research and conservation programmes, and environmental assessments, conservation initiatives suffer from duplication and reduced impact.

Insufficient financial support also delays or limits effective and timely conservation efforts. For example, Russian nature reserves lack dedicated state funding for international activities. Thus, Russian protected areas are forced to seek extra-budgetary funds, mainly from international organizations and foundations, which is not always possible. As a result, international contacts and projects become an additional financial burden, without contributing to the stability of cooperation. In contrast, Chinese reserves receive targeted budget funding for international cooperation efforts.

The shortage of qualified and trained experts who can coordinate cross-border efforts also hampers conservation efforts. Contacts between the countries occur only at the higher levels, which prevents specialists from directly engaging with each other practically and in the field. Additionally, language barriers further complicate communication efforts.

Visa regimes and border policies also impede the free movement of staff across borders, particularly as transboundary reserves entail joint fieldwork. Staff need to resort to obtaining expensive tourist visas, which highlights the need for solutions such as service passports for reserve employees.

2.3 Insufficient Community Engagement and Untapped Tourism Potential

Poor public awareness hampers conservation efforts. Many local communities are unaware of the species' endangered status or conservation laws. Insufficient public outreach and education efforts reduce awareness and uncoordinated efforts to promote environmental knowledge weaken the social foundations necessary to garner community support for conservation initiatives. Such lack of awareness also has the potential to exacerbate human-wildlife conflict.

Under-utilization of tourist and recreational potential limits opportunities for sustainable development, broader public engagement, and employment and financial possibilities. The natural landscape of the transboundary protected areas also remains under-utilized for tourism. Currently, there is insufficient infrastructure and promotion to support nature-based tourism, which has the potential to enhance local employment activities, generate income and spread awareness and knowledge.

Therefore, coordinated, transboundary cooperation is essential for collecting accurate data on population and habitats, protecting cross-border corridors and enforcing anti-poaching measures, especially since these animals are migrating across borders. Strengthening such cooperation will improve conservation outcomes and ensure that conservation efforts on all sides of the transboundary region are aligned and coordinated. The following chapter outlines strategic recommendations that have been developed through the project to address these challenges and can inform policy-making and guide actions for the conservation of the big cat species across North-East Asia.

3 Recent Developments and Strategic Recommendations

The three components of the project "Transboundary Cooperation for Conservation of Amur Tigers, Amur Leopards and Snow Leopards in North-East Asia" resulted in a wide array of data, literature and actionable guidance to support the conservation of the big cat populations, strengthen transboundary cooperation and raise public awareness and engagement.

Building on this momentum, in May 2024, a landmark intergovernmental agreement was signed between the Russian Federation and China to create the transboundary wildlife reserve "Land of Big Cats". The agreement was signed by the heads of relevant departments of the two countries during President Vladimir Putin's visit to Beijing. The new reserve unites the territories of the two protected areas in the Russian Federation: Land of the Leopard National Park and the Kedrovaya Pad Nature Reserve, with the Northeast Tiger and Leopard National Park in China. The agreement envisions strengthening scientific collaboration and facilitating the exchange of animal observation data. It also prioritizes enhancing the protection of conservation areas against poaching and forest fires. In parallel, initiatives to advance eco-education and promote ecotourism are planned in the Land of Big Cats. Since then, several bilateral meetings have taken place, a two-year work plan has been adopted, and the first joint activities have been implemented, including cultural exchanges, joint ecological festivals, youth and tourism exchanges, and even a recent ranger competition in China. By the end of the year, a joint Amur tiger and leopard census will be conducted using shared camera-trap data — efforts that have already gained wide media coverage and raised public awareness across both countries.

Based on the research, the following strategic recommendations address the key conservation challenges discussed in Chapter 2 and offer practical steps for enhancing regional collaboration. Together, they provide the foundation for coordinated efforts that can lead to the long-term sustainable conservation of these iconic big cat species.

3.1 Priority actions to tackle anthropogenic and biological threats

Based on the challenges faced by the big cat populations across the region, a set of priority actions has been identified that address human and biologically-induced threats. These actions, drawn from research, are either being implemented in new management programmes or represent critical steps that should be adopted to strengthen conservation efforts.

Combat poaching and illegal wildlife trade

In terms of the results of conservation efforts and with the support of modern science and technology, significant progress has been made in the Northeast Tiger and Leopard National Park. The intensity of human activity within the national park has decreased significantly, creating a more secure habitat. As a result, poaching has been almost eliminated, marking a major success in protecting Amur tigers and leopards in the region. Nonetheless, anti-poaching campaigns must continue to be strengthened by

- aiming to achieve zero poaching
- removing snares, nooses, and traps

- confiscating illegal weapons
- implementing the SMART system for patrolling across forest bureaus
- promoting bilateral monitoring and patrolling
- exchanging anti-poaching methods

Improve bilateral interactions between departments of respective countries by

- supporting joint enforcement through coordinated working groups and improved border control protocols.

Curb habitat loss, fragmentation and prey depletion

Recent developments highlight that within protected areas, no commercial logging is permitted and infrastructure expansion is strictly limited. This ensures the long-term preservation of intact forest habitats that remain free from industrial development pressures. By maintaining such restrictions, these national parks and reserves serve as critical refuges for biodiversity and play a vital role in ecosystem sustainability. Other actions include:

Restore habitat by

- creating a unified management system for protected areas
- unifying disparate habitat of the big cats
- identifying and creating ecological corridors to allow species movement
- restoring the ecosystem
- expanding the range of habitat to limit interspecific competition between sympatric carnivores which can become acute as densities increase

Support prey base by

- implementing a system of biotechnical measures such as arranging salt mineral licks to provide nutrients to prey species and helping to increase their population
- creating a sustainable food base, such as feeding wild ungulates during snowy winters to restore their population

Implement coordinated monitoring and research by

- conducting joint environmental assessments to ensure development does not harm habitats
- standardizing data collection and mapping to understand land use and corridors

Address genetic isolation, inbreeding and low reproduction

Reduce genetic vulnerabilities by

- creating transboundary corridors, such as the proposed “Land of the Big Cats”, which would enable free migration of individual animals and increase genetic exchange
- introducing measures for blood refreshment to increase diversity

3.2 Priority Actions to Facilitate Transboundary Cooperation and Coordination

For the effective conservation of the Amur leopard, the Amur tiger and the Snow leopard, whose habitats span national borders, transboundary cooperation is essential. Strengthening collaboration between protected areas across the landscape will significantly enhance conservation outcomes by streamlining efforts and enabling easy cross-border access for experts to improve data exchange and facilitate the sharing of experience and information.

Enhance transboundary coordination

Establish dedicated central coordinators to align efforts for transboundary cooperation by

- creating a formal coordination structure in the form of a permanent secretariat called the "Coordination Council of the Transboundary Reserve", particularly with respect to the development of the "Land of Big Cats"
- building connections among reserves and protected areas, and involving international organizations, programmes and external experts, as well as government bodies across the Russian Federation and China
- forming a cross-border network of Russian-Chinese protected areas, particularly by engaging the executive authorities of Primorsky Krai and Rosprirodnadzor's Far Eastern Department

Consolidate multiple national agencies with overlapping functions

Improve bilateral interactions between departments of respective countries by

- ensuring coordinated governance by developing a five-year action plan to be implemented through Joint Commissions and Working Groups, particularly for the development of the "Land of Big Cats"
- streamlining operational decision-making by limiting the involvement of multiple national agencies
- coordinating the development of long-term work plans by national representatives and delegating day-to-day coordination and management to local protected areas' authorities.
- implementing joint monitoring and research programmes, removing restrictions on the exchange of information, even from open sources

Implement coordinated monitoring and research by

- removing inconsistencies in monitoring methodologies by standardizing and combining camera trap monitoring networks and data collection methods
- preparing joint environmental assessments to ensure compatibility of development activities
- conducting joint research on key topics, such as predator movement, genetics, preparing cartographic materials and conducting regular analysis of cat populations
- creating integrated research laboratories to study and rehabilitate big cats, which can also serve as international research centres

Increase financial support for international activities

- securing financial support, particularly for Russian border reserves, for pilot cooperation projects
- obtaining funding for joint meetings with specialists of protected areas in Chinese territory

Engage qualified and trained experts

Enhance capacity-building by

- organizing bilateral meetings and exchanging technical personnel, information, best practices and experience across borders
- developing joint training programmes, and inter-university and inter-academic exchange of experts and students
- organizing language courses to remove language barriers

Ease visa regimes and border policies

- developing a simplified border-crossing/visa procedure for reserve staff involved in international projects
- strengthening ties between Russian border reserves and border troops

3.3 Priority Actions to Boost Community Engagement and Tourism

Engaging local communities and promoting sustainable tourism across shared borders are also essential components for the long-term conservation of the big cat species. The ultimate goal of such efforts would be to encourage a positive attitude among locals to view the reserves as valuable regional assets, raise public awareness, build community support and foster economic activities that are aligned with conservation goals.

Expand public outreach, education, employment opportunities

- promoting environmental knowledge through joint exhibitions, media campaigns, and children's art contests
- supporting employment through the development of local crafts and the service sector
- exchanging news, publications, promotional brochures, etc., in different languages about cross-border cooperation and information on national parks, maps, and data
- exchanging visits between journalists, children and youth delegations

Harness tourist and recreational potential

- encouraging ethnographic tourism by displaying natural and cultural-historical objects for tourists in tourist centres in the reserves
- encouraging photo tourism by creating photo shelters for photographers who want to capture animal species in their natural habitats
- boosting ecological sports tourism by creating eco-trails and routes, building guest houses and organizing excursions, facilitating mountain sports and trekking
- supporting scientific tourism by encouraging visits to territories by delegates, researchers, and scientists, and by holding conferences and campaigns

Conclusion

The project "Transboundary Cooperation for Conservation of Amur Tigers, Amur Leopards and Snow Leopards in North-East Asia," implemented by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) Subregional Office for East and North-East Asia (SOENEA), under the North-East Asian Subregional Programme for Environmental Cooperation (NEASPEC), has resulted in significant research and initiatives that can inform active policy and decision-making and facilitate transboundary cooperation for the conservation of these iconic big cat species.

Most critically, these efforts have resulted in a landmark intergovernmental agreement that was signed in May 2024 between the Russian Federation and China, to create the transboundary wildlife reserve "Land of Big Cats", uniting protected areas from both countries. The agreement aims to strengthen scientific collaboration, improve monitoring and enhance protection against poaching and forest fires. It also envisions eco-education and ecotourism initiatives, marking a vital step toward the long-term conservation of the big cat species.

Within protected areas, commercial logging is now prohibited and infrastructure expansion is strictly limited, safeguarding forests from industrial pressures. These measures ensure the long-term preservation of habitats and the overall biodiversity.

Targeted transboundary cooperation has resulted in the significant expansion of the habitat range available to the big cat populations with the establishment of the "Land of the Leopard National Park" in the Russian Federation and the "Northeast Tiger and Leopard National Park" in China. The Sino-Russian network of protected areas has grown twelvefold – from 1,532 km^2 to 18,045 km^2 – which now covers the majority of the current range for both the Amur tiger and Amur leopard. With a transboundary ecological corridor that measures about 280 km, the active movement of animals has been greatly facilitated across both countries.

Such conservation efforts have resulted in the remarkable recovery of the critically endangered Amur leopard and Amur tiger species. In the South-Western Primorye (SWP) region, the leopard population grew from 53 individuals in 2014 to 111 in 2021. In the Laoyeling Tiger Landscape in China, leopard numbers increased from 12 in 2013 to 60 by 2020. For the Amur tiger, the population in SWP doubled from 30 individuals in 2014 to 60 in 2021, while in Laoyeling, China, it rose substantially from 7 in 2013 to 50 in 2020. The population of the Snow leopard has been shown to be stable with a number of findings that confirm its migration across the Sino-Russian border. This success testifies to the criticality of transboundary cooperation in conserving big cat species whose habitats transcend national borders.

Strengthening transboundary cooperation by streamlining its governance structures and mechanisms, establishing joint and coordinated monitoring and data collection methods, and encouraging the exchange of technical expertise and best practices can further enhance conservation outcomes. Additionally, investing in capacity-building, engaging communities and youth, and advancing education and ecotourism activities will help raise awareness and foster broader public engagement, ultimately increasing the number of people who actively support conservation. Together, these measures are important steps towards safeguarding the long-term survival of the Amur tiger, the Amur leopard and the Snow leopard.


ESCAP
Economic and Social Commission
for Asia and the Pacific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North-East Asian
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