This report will be made public. If it contains confidential or sensitive information, please also provide a revised report for sharing with the public.

Section I. Project Information	
Project Title: Monitoring and connecting Russia's Amur leopards	
Grantee Organisation: Wildlife Conservation Society (WCS)	
Location of project: For reference, Land of the Leopard National Park is at: 43.18 N, 131.48 E	
Size of project area (if appropriate): LLNP study area: 756 km^2 Ussuriysk study area: 1,007 km^2 Razdolnaya Corridor: Roughly 350 km^2	**No of tigers and / or Amur leopards in project area, giving evidence & source:** The Amur leopard (protected in the Red Books of Primorsky Krai and Russian Federation; listed as "Critically Endangered" by IUCN). Our 2018 publication estimated a stable global population of Amur leopards at 84 adults/subadults in 2014-2015. In 2024, LLNP's *Chronicles of Nature* identified at least 160 individual Amur leopards in Russia alone. Over the course of our monitoring efforts in 2025, we estimated 15 ± 3 Amur leopards in our LLNP study area (note: we updated our abundance estimates to relate specifically to the minimum convex polygon surrounding our camera traps). In our Ussuriysk study area, we did not detect any Amur leopards.
Partners: *(Please give details of partners, including communities, academic institutions etc. for this project.)* Since 2016, the Wildlife Conservation Society's work in Russia has been a collaboration between the WCS Global Conservation Program and the independent, Russian-registered NGO "ANO WCS". As this proposal was developed by staff of both WCS Global and ANO WCS, we hereafter use "we" to describe our joint efforts. Given our decades of investment in Amur leopard conservation in Russia, we maintain broad support among government agencies involved in wildlife conservation. We are supported by the Russian NGO "Far Eastern Leopard," a functional body of the Russian government's efforts to save Amur leopards. This NGO requested that we begin monitoring Amur leopards in Ussuriysk Reserve and funds much of our work to do so thanks to their trust in our expertise and knowledge.	

Section II. Project Results

Project Contact Name: (*main contact via email)* Scott Waller, Dale Miquelle, Jonathan Slaght
Email: swaller@wcs.org, dmiquelle@wcs.org, jslaght@wcs.org
Reporting period: February 1, 2025 – January 31, 2026

Please ensure that your report relates to the objectives and activities detailed in your proposal and logframe. Please include results data in Section II and Section III.

Long Term Impact: (*How has this work contributed to the vision and long-term impact that your project aims to achieve?)*

Our vision is for Amur leopards to reach a stable, genetically-diverse population size within its historic – and growing – range. During this project, we worked towards this vision by conducting rigorous population monitoring, and by gaining critical baseline data on leopard and prey use of a critical ecological corridor that limits genetic recovery. This award also helped us start a new, long-term project to improve connectivity of leopards between the Changbai and Sikhote-Alin Mountains. These big cats must be able to move freely between habitats for their long-term genetic viability, yet a major highway poses a serious barrier to meeting this need. As explained below, our first year of monitoring data provided key, initial insights that will be used to guide later conservation interventions.

Conservation Outcome: (*What are the actual changes that this project has achieved?)*

We made many achievements during this project to support the conservation and recovery of Amur leopards in the Russian Far East.

In northern LLNP and adjacent hunting leases, we also observed a slight dip in leopard densities, which appear to have reached a plateau in our study area over the last several years. This could be the first sign that the remarkable recovery of Amur tigers has led interspecific competition, just starting to limit leopard recovery. We also led a second year of camera trap monitoring of reintroduced Amur leopards in Ussurisk Reserve. Unfortunately, no leopards were observed: two of males released in 2023 have dispersed far to the west and north, and neither the resident female nor wild male observed last year were seen again.

Our new connectivity project along the Razdolnaya transportation corridor provided key insights into current levels of wildlife use of bridges and culverts along highway A-370, the safest places for them to cross. These findings will be used to inform the creation of an IUCN category IV protected area within the corridor and will eventually facilitate improvements – like increasing vegetative cover and reducing noise and light pollution – that will help leopards and their prey move past this barrier as safely as possible.

Summary of activities and achievements: *(Please provide a narrative summary for use in our communication materials Max 300 words)*

The support provided by the WildCats Conservation Alliance (WCCA) through this award allowed us to make great strides in protecting and connecting Amur leopards in the Russian Far East. We led Amur leopard population monitoring at two key sites in the southern Russian Far East and initiated a new project to research and improve connectivity of Amur leopards and their prey across highway A-370, a significant barrier for big cats moving between the Changbai Mountains to the west (including Land of the Leopard National Park) and suitable habitat to the east in the Southern Sikhote-Alin Mountains. We deployed 10 camera traps at six culverts and bridges and monitored wildlife and human use year-round. We found clear seasonal patterns, with large mammals avoiding places with high human use and being recorded almost exclusively between late spring and early fall. Though more data is needed, these early indicators will provide the scientific basis for on-the-ground improvements and management crossing structures.

Details of activities and results: (*Please give detailed narrative of the results of each objective & output. Please include measures for example patrol numbers and distances covered, #people trained or #people attending meetings/workshops or refer to figures in your tables below)*

Objective 1: Continue Amur leopard monitoring in LLNP

Activity 1.1. Deploy and collect cameras in LLNP

In January 2025, we deployed 138 camera traps across 66 locations spanning roughly 750 km2 across northern Land of the Leopard National Park and the adjacent Nezhinoe Navel Hunting Lease. After a 90-day period had passed when all cameras were active, all cameras were retrieved from the forest. Only 2 cameras were stolen this year from a single location, leaving us with working data from the remaining 65 locations.

After reviewing 330,767 photographs, we identified 32 individual Amur leopards, including 14 females and 3 individual cubs (**Table 1**). Using spatial capture-recapture (SCR) analyses, we estimated a population density of 1.36 [95% CI: 0.92-2.00] leopards per 100 km^2. This point estimate is 27% below last year's estimate, though the two years' confidence intervals overlap considerably (**Figure 1**).

The sustained recovery of Amur leopards – as shown by their persistent, much greater density from when we started monitoring – is a smashing conservation success, no doubt driven by improvements in law enforcement and recovering prey (**Figure 2**). Looking at the shape of the trends in leopard population growth, we may be seeing the start of density-dependent, interspecific competition between tigers and leopards limiting leopard population size, especially given that sika deer dominate the prey base for both species. Such consequences of interspecific competition have been observed in other places where the species coexist (e.g., Harihar et al., 2011), though not yet in Northeast Asia. Past work in this study area found no evidence that either species limited the other (Matiukhina, 2020), but that was when densities were considerably lower. Fortunately, leopards have expansive suitable habitat for dispersal to the west in China's Northeast China Tiger and Leopard National Park. We might also expect an increase in leopard detections east as young leopards try to avoid competition with tigers. Hopefully, we can continue to monitor the Razdolnaya corridor region and determine if detections of leopards by our camera traps and snow track surveys begin to increase, providing further insights into the relationship between interspecific competition, dispersal rates, and drivers of Amur leopard recovery.

Logframe targets: 60% of cameras placed in the forest by Month 1 [**achieved**]; 100% of cameras actively collecting data by month 3 [**achieved**]; 100% of cameras collected by months 5-6 [**achieved**]; data analysis complete [**achieved**].

Table 1. Number of individual Amur leopards detected during each camera trapping season, 2015-2025. Detections are broken down by sex and age.

Age/sex	Number of leopards detected per year										
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Males	6	6	10	9	12	8	11	11	12	10	15
Females	5	5	12	15	14	16	18	21	21	14	14
Unknown sex	2	1	4	2	0	0	2	0	2	4	0
Cubs	3	0	1	3	0	5	3	6	1	0	3
Total	*16*	*13*	*27*	*29*	*26*	*31*	*34*	*38*	*36*	*28*	*32*

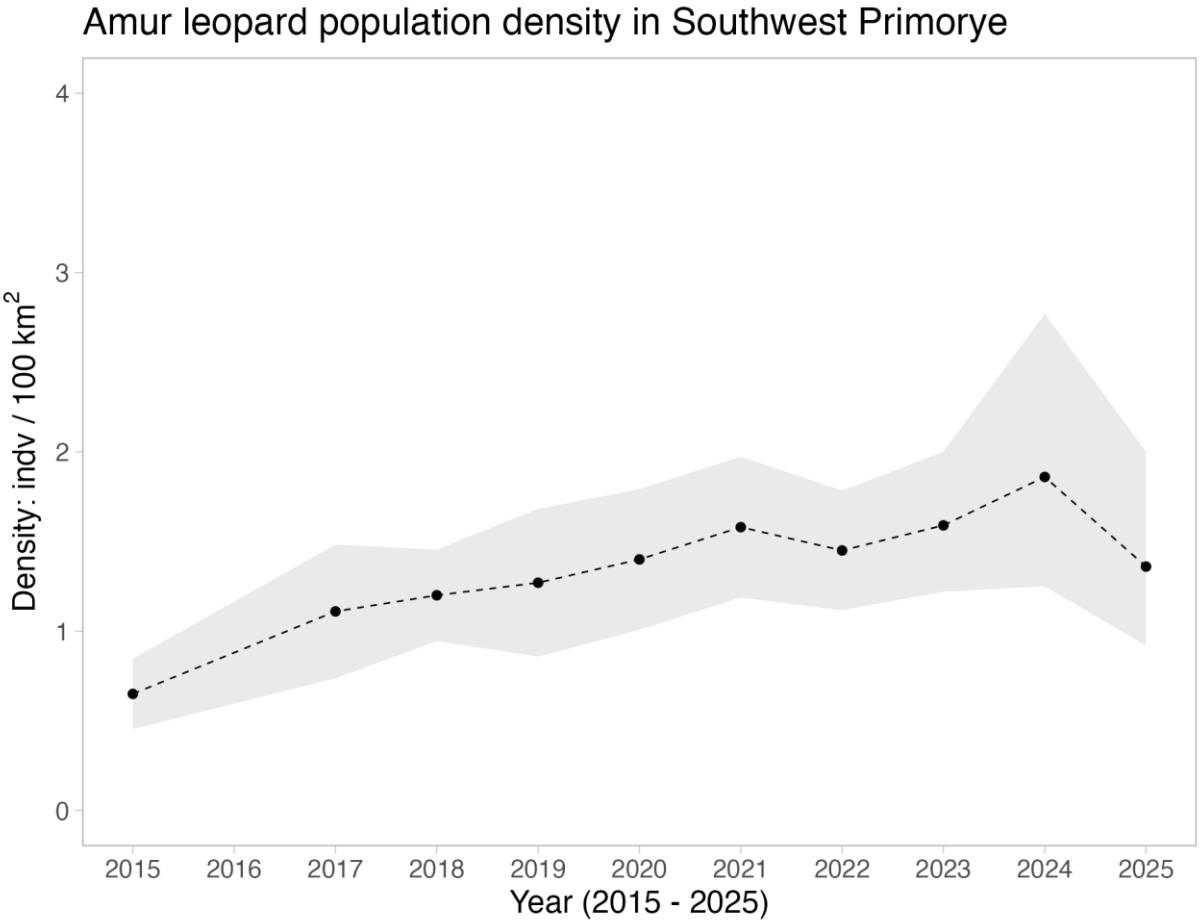
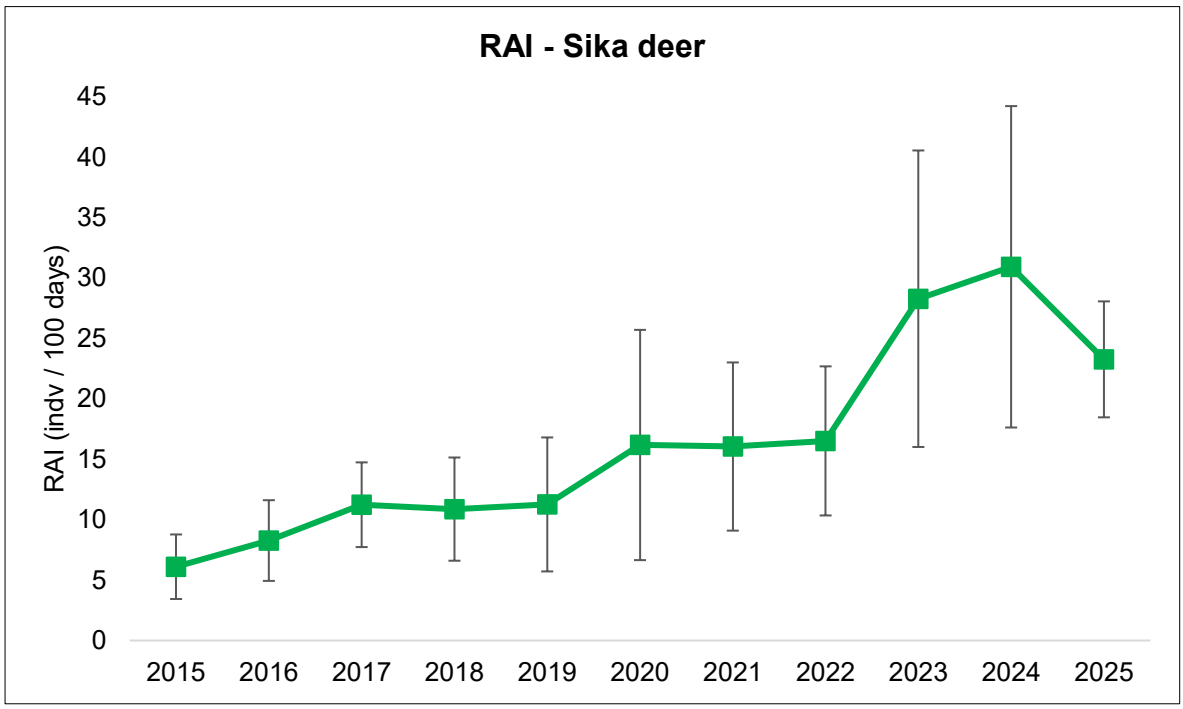


Figure 1. Amur leopard population density estimates in Southwest Primorye, Russian Far East, 2015-2025. Black dots represent the point estimate of density, and the shaded grey regions are the 95% confidence intervals.



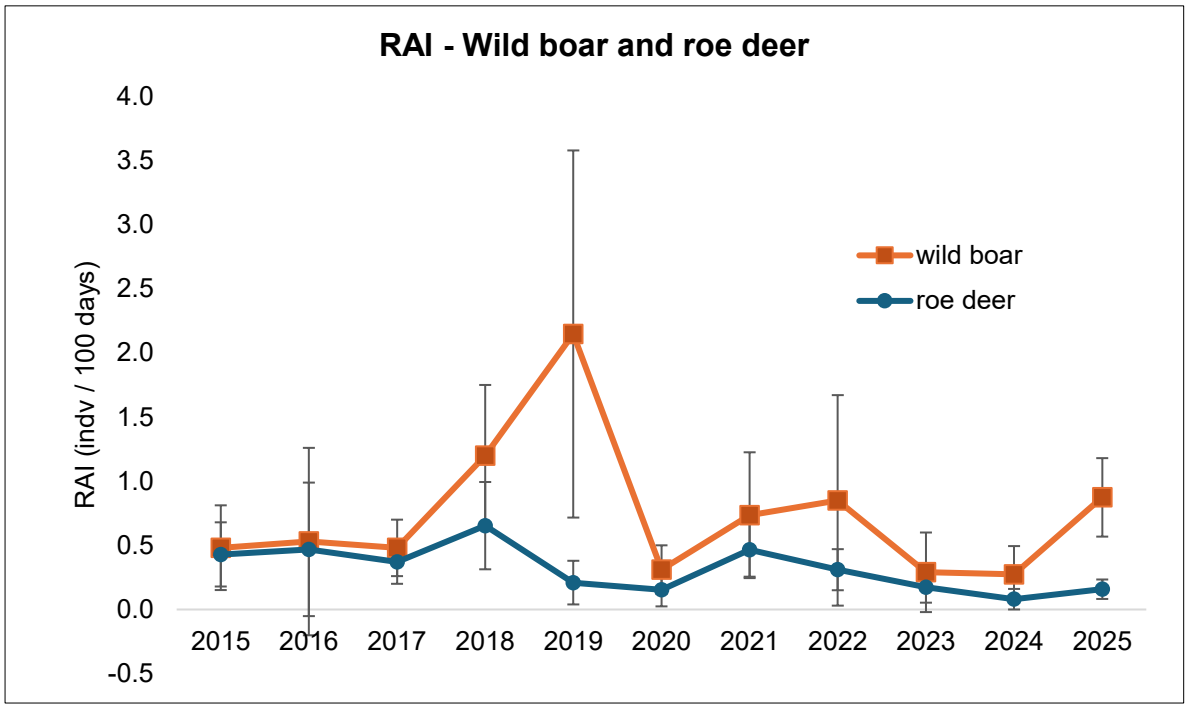


Figure 2. (TOP) Sika deer relative abundance index (RAI) estimates from 2015 – 2025 based on camera trapping data in Southwest Primorye, Russian Far East; (BOTTOM) Roe deer and wild boar RAI estimates during the same period and in the same study area.

Objective 2: Collect baseline data on wildlife use of crossings along Highway A-370

Activity 2.1. Collect baseline data on current wildlife crossing characteristics

A fundamental component of this connectivity project is to determine if characteristics of crossing structures – such as their size (measured by an "openness index"), distance to vegetation, and levels of human use – affect wildlife presence and their use of these structures. As explained in our interim report, ANO staff initially measured six of the 10 crossings that were suitable for camera trap deployment (see *Activity 3.2* below). Among the six structures we did assess, openness indices ranged from 0.01 (the smallest culvert) to 33.75 (the largest bridge) (**Table 3**). Four of the six structures had a minimum height of 5 m as recommended by Wildlife Institute of India for big cats and an openness index of at least 2, based on the foundational research by Clevenger & Waltho (2000). Distances from crossing structures to forest edge ranged from 15-57 m; terrain beneath all structures was open and exposed. Strategic fencing along the highway can guide wildlife to the safe crossings (and also prevent them from crossing the road where they are at risk of being hit by vehicle traffic), but no fences were found to facilitate such crossing use by wildlife.

Unfortunately, due to time and resource constraints, our team still has not measured characteristics at the remaining four crossings, which have high human activity and were considered too risky to have cameras deployed without being stolen. We note that though we planned to have these measurements complete by now, the lack of measurements does not impact the quality of our data collection at other sites. After several discussions, ANO staff have confirmed their plan to measure these remaining structures later in Spring 2026. *Logframe target:* description of crossing characteristics for wildlife [**partially achieved:** 6 of 10 complete].

Table 3. Characteristics of six crossing structures along highway A-370 between the town of Razdolnaya and the outskirts of Ussuriysk, Russian Far East. "Visibility" indicates how well the opposite opening of the structure can be seen. The openness index is calculated by width x height / length. East ("E") and West ("W") distances to vegetation are measured from the outside edge of the structure to adjacent natural vegetation (typically forest but sometimes wetland).

name	crossing type	visibility	approach	substrate	width (m)	height (m)	length (m)	openness index	W veg distance	E veg distance
01 creek	culvert	full	flat	pavement	3	2.5	80	0.09	20	15
06 chertovka bridge	bridge	full	flat	gravel, dirt, grass	22	5	35	3.14	57	20
07 boyovka river	bridge	full	flat	gravel, streambed	45	15	20	33.75	30	30
08 boyovka creek	culvert	full	flat	gravel, streambed	12	20	120	2.00	25	40
09 culvert	culvert	mostly visible	moderate slope	pavement	1.4	1.4	131	0.01	15	20
10 bridge	bridge	full	flat	gravel, dirt, grass	10	12	25	4.80	30	30

Activity 2.2. Deploy and monitor year-round cameras at crossing infrastructure

We deployed 10 camera traps at six crossings and kept them operational throughout the year. Due to high risk of theft if exposed, we were limited to placing cameras in locations where they could be camouflaged, and at some structures, we were only able to place them on one side of the structure.

Though our ability to collect data was constrained, our year-round monitoring provided some critical Insights. First, two of the four crossing structures meeting the minimum height and openness requirements for large mammals (above) also had near-constant levels of human use, due to the access roads running underneath the bridges, which likely deterred use by wildlife. We were thrilled, however, to obtain six independent detections of tigers, all of which were at crossing structures with little to no human use. Five of these detections were at structures meeting height and openness guidelines. Other factors seemed to explain presence of tigers as well: tigers appeared more often at sites with higher presence of prey, and all detections occurred within a relatively short period of July to October, when vegetation cover is likely highest. Ungulate detections were concentrated during the "leaf season" as well, with almost all detections occurring between May and October. Together, these data suggest tiger presence at crossing structures is determined by season, human disturbance, perceived "crossability" (i.e., openness and vegetation cover), and presence of preferred prey. Another full year of monitoring will be critical to strengthening this data set, providing sufficient sample size for statistical analysis of these relationships. We also hope to obtain detections of leopards, though this may be very unlikely given their absence this last year.
Logframe target: cameras active at crossings along Highway A-370 [**achieved:** 10 active cameras]

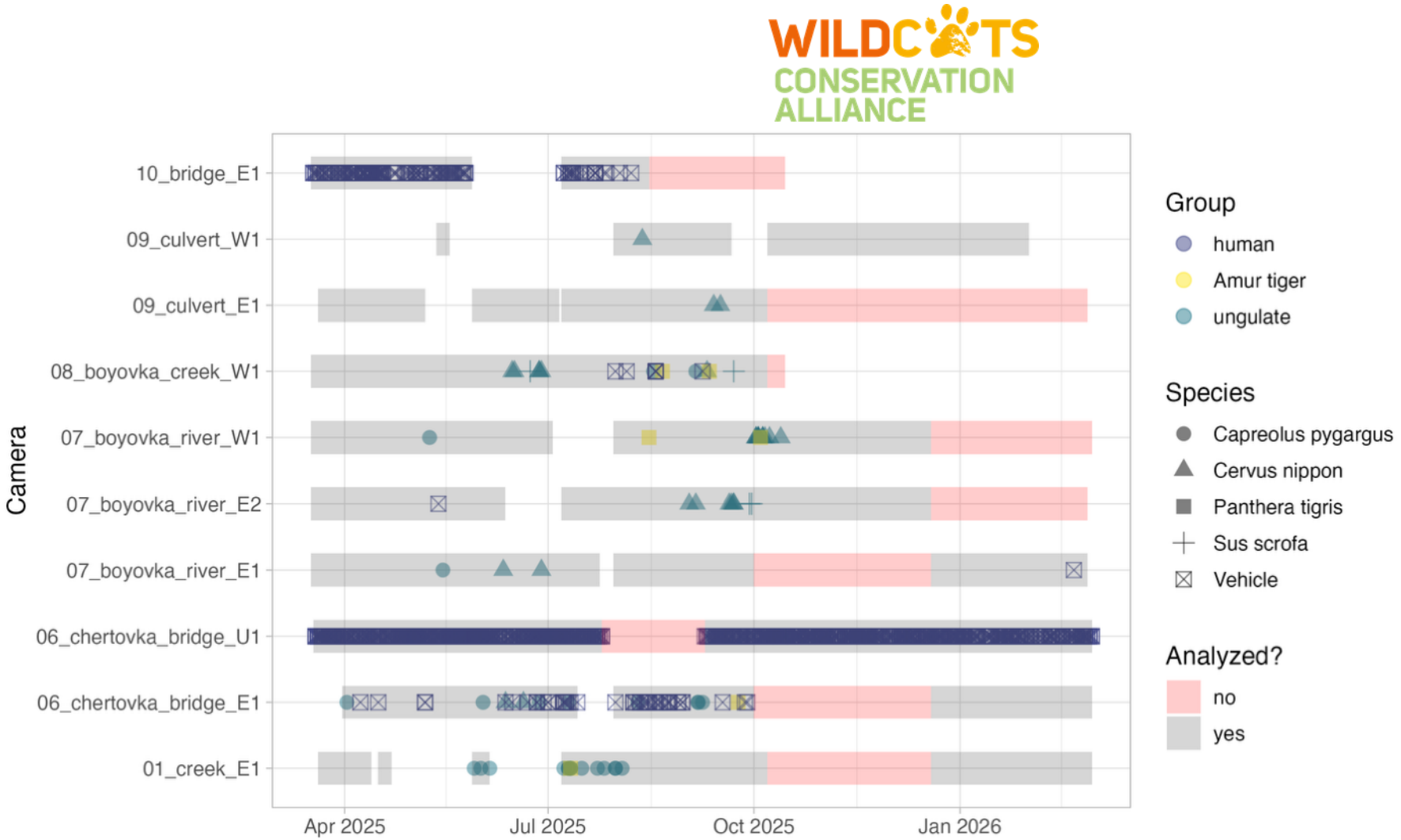


Figure 3. Detections of ungulates, Amur tigers, and human activity at 10 camera traps placed along six crossing structures along highway A-370 in the Russian Far East. Cameras are organized from north (10_bridge) to south (01_creek). Shapes indicate specific species and are coloured by group. The horizontal bars indicate the time during which cameras were active from March 2025 to March 2026: grey indicates active and data already analysed, while red indicates the camera was active, but the data have not yet been retrieved and/or analysed. Among camera names, “E” indicates east side; “W” indicates west side; and “U” indicates directly under the crossing. Cameras “10_bridge_E1” and “08_boyovka_creek_W1” were stolen in October 2025, and we are actively seeking more secure locations to again monitor these crossing structures.

WildCats Conservation Alliance, (formerly ALTA & 21st Century) is a wild tiger and Amur leopard conservation initiative between Dreamworld Wildlife Foundation and Zoological Society of London, (UK charity # 208728).

Objective 3: Continue monitoring Amur leopards around Ussuriysk Reserve

Activity 3.1. Deploy and collect cameras in and around Ussuriysk Reserve

At the end of 2024, we deployed 138 camera traps at 67 locations in Ussuriysk Reserve and surrounding hunting leases for a second year of population monitoring of Amur leopards in the southern Sikhote-Alin mountains. We unfortunately lost eight cameras across four locations to theft despite our efforts to camouflage each unit. Once cameras were retrieved in Spring 2025, our staff immediately began sorting through images in search of leopards and their prey.

Unfortunately, we did not observe either of the Amur leopards that had established home ranges within Ussuriysk Reserve in Fall 2023. We left several cameras to monitor year-round at the last known location of the female, but she never reappeared. It is likely that both Amur leopards died, whether from natural or human causes.

There is still hope for a leopard population to establish here: in Fall 2025, LLNP and the Severtsov Institute (Russian Academy of Sciences) released three more Amur leopards to Ussuriysk. Fortunately, their collars are working, and two of them appear to have established home ranges just south of the reserve in the Orlon Hunting Lease. With support from ANO Far Eastern Leopard, ANO WCS is continuing to lead camera trap monitoring efforts, as well as tracking individuals to understand kill rates, movement patterns, and interactions with each other and other species.
Logframe targets: cameras placed, active, and collected by Months 4-5 [**achieved**]. Data analysis completed [**achieved**].

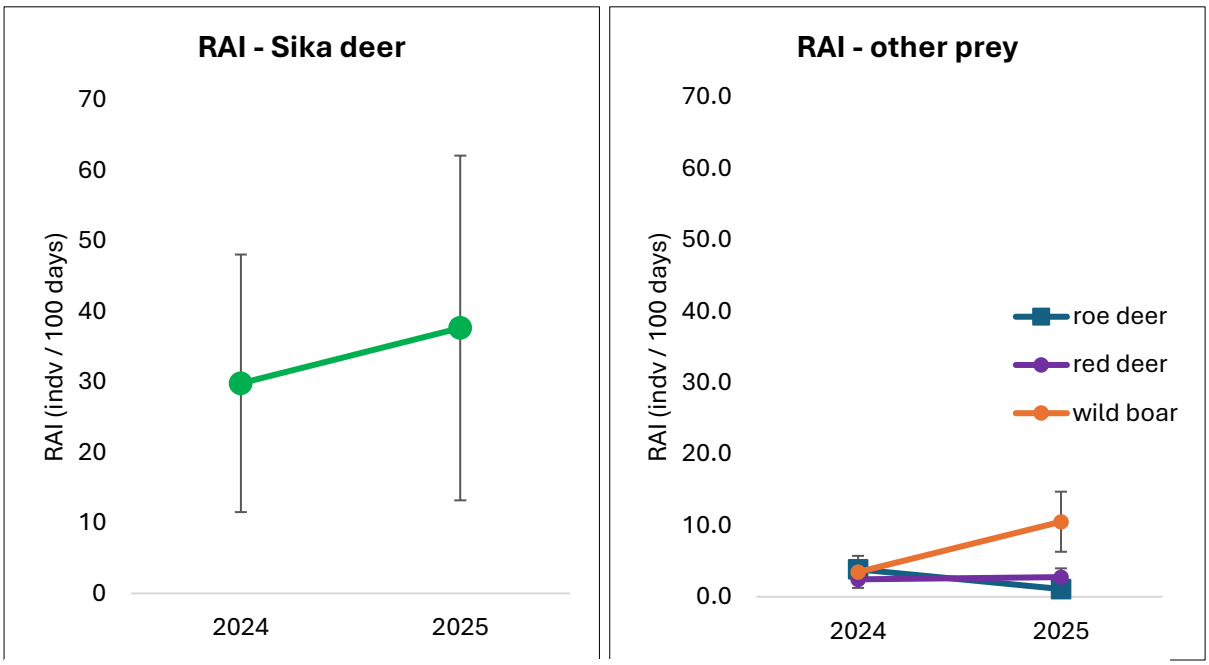


Figure 4. (Left) Sika deer relative abundance index (RAI) estimates in 2024 and 2025 based on camera trapping data from Ussuriysk Reserve and adjacent hunting leases, Russian Far East; (right) Roe deer and wild boar RAI estimates during the same period and in the same study area.

Key achievements of this project: (*Please give a bullet point list of key measurable outputs*)

- Camera traps at 133 locations across our LLNP and Ussuriysk Reserve study areas;
- 1.36 [95% CI: 0.92-2.00] leopards per 100 km^2 estimated in our LLNP study area;
- Highest levels of wild boar relative abundance in our LLNP study area since African Swine Fever arrived in Fall 2020, possibly indicative of recovery;
- 10 camera traps deployed at 6 crossing structures along a section of highway A-370 that is critical to connecting big cats in LLNP to the Sikhote-Alin Mountains;
- 6 independent detections of Amur tigers at crossing structures, the first evidence of its kind in Russia;
- Year-round data on presence of tigers and prey at these structures, revealing patterns driven by structure characteristics, season, and human use.

Obstacles to success: Give details of any obstacles/challenges to success that the project has encountered. (*Any changes to the project that have affected the budget and timetable of project activities should have been discussed prior to the end of the project)*

Our monitoring program faces similar challenges with politics and funds, but the work on the ground itself faced no real challenges. By now, ANO staff have been leading camera trap surveys for over a decade across the Russian Far East and know which obstacles to plan for.

Lastly, our important work monitoring wildlife use of crossing structures along highway A-370 faced serious challenges with camera placements: our staff were hard-pressed to find locations that would provide quality data yet avoid the risk of theft. Despite our constrained ability to monitor these sites, we are very pleased with our initial results and are confident they will be sufficient both to help in protected area creation this year, as well as to guide future interventions to improve these structures for wildlife use.

Monitoring and Evaluation: (*Describe the methods used to monitor and evaluate the progress of the project)*

Output	Indicator	Monitoring Method	Completion Status
Objective 1: Continue Amur leopard monitoring in LLNP			
Output 1 Annual estimates of leopard densities in LLNP	1. Camera trap season. Milestones: • Month 1 = 60% cameras placed in the forest; • Month 3 = 100% cameras actively collecting data. • Months 5-6: 100% of cameras collected Q3 Y1: data analysis begun. Month 12: data analysis complete	1. Images of leopards and prey 2. Estimates of 2025 leopard population size and density in study area 3. Understanding of leopard population trends.	**COMPLETED**
Objective 2: Collect baseline data on wildlife connectivity across the *Razdolnaya* development corridor			

Output 2 Knowledge on wildlife use of crossing infrastructure of Highway A-370	*Activity 2.1.* • Field visits to crossings, record characteristics, summarise *Activity 2.2.* • Number of cameras active at crossings along Highway A-370	*Activity 2.1.* • Findings provided in summary document *Activity 2.2.* • Images of target species	**COMPLETED**
Objective 4: Monitor reintroduced Amur leopards in Ussurisk Zapovednik			
Output 3 Annual summary of outcomes of leopard reintroduction project in Ussurisk	1. Camera trap season. Milestones: • Month 12 = 60% cameras placed in the forest; • Month 2 = 100% cameras actively collecting data. • Months 4-5: 100% of cameras collected Q3 Y1: data analysis begun. Month 12: data analysis complete	1. Images of target species (reintroduced leopards) 2. Estimates of leopard population density and home range size in and around Ussurisk Reserve	**COMPLETED**

Shared learning: *(How will you share the outputs and learning from your project, in what format and with whom?)*

We produce annual reports summarizing our leopard monitoring efforts in both LLNP and Ussuriysk Reserve which we share with the Russian Ministry of Natural Resources. Special interest is being given to Ussuriysk Reserve and the status of reintroduced leopards there. The lack of support from WCCA in 2026 means that we are seeking other sources of support for monitoring at both sites and may not be able to continue this work.

Regarding our connectivity project in the Razdolnaya Corridor, we are planning a summary report for partners to be complete in Summer 2026, which will guide the creation of an IUCN Category IV protected area (most likely ~300 km^2 in size) to prevent further development and facilitate restoration activities. We also plan to organize a round table with partners and experts in Fall 2026, following successful protected area creation, to share our monitoring results, discuss priority interventions to improve connectivity, and help delegate tasks to appropriate implementing agencies.

Budget Narrative:

During the second half of this grant period, spending was mostly on track with our proposed budget with only minor variations.

Media: *(Please provide a list of publications and media both local and national which mentions the work funded by this project and/or mentions WildCats Conservation Alliance)*

N/A

Have you provided at least 2 blogs? Y/N?

Yes, please see attached.

Have you provided at least 15 high quality images with details of the relevant credit? Y/N?

Yes, please see attached.

References

Clevenger, A. P., & Waltho, N. (2000). Factors Influencing the Effectiveness of Wildlife Underpasses in Banff National Park. *Conservation Biology*, *14*(1), 47–56.

Harihar, A., Pandav, B., & Goyal, S. P. (2011). Responses of leopard Panthera pardus to the recovery of a tiger Panthera tigris population. *Journal of Applied Ecology*, *48*(3), 806–814. https://doi.org/10.1111/j.1365-2664.2011.01981.x

Matiukhina, D. (2020). *Resource partitioning and density drivers of two endangered large felids: Amur tiger (Panthera tigris altaica) and Amur leopard (Panthera pardus orientalis) in the Russian Far East*. State University of New York.

Section III. Appendix (Please populate this section with details from section II)	
Did you carry out camera trapping as part of this project? Y/N Yes	
If yes: **Total camera trap nights/days:** LLNP & adjacent hunting lease: 7,449 Ussurisk Reserve: 7,575	**Total area surveyed:**
Numbers of tiger/leopard/prey recorded **Southwest Primorye** (LLNP & adjacent hunting lease): - Amur leopards: 29 adults/subadults, 3 cubs Relative Abundance Indices of three prey species (average number of independent detections per 100 days; see Figures 3 and 4 below): - Wild boar: 0.9 detections / 100 days - Sika deer: 23.3 detections / 100 days - Roe deer: 0.2 detections / 100 days **Ussurisk Reserve** - Amur leopards: 0 adults/subadults , 0 cubs	

- Wild boar: 10.5 detections / 100 days - Sika deer: 37.6 detections / 100 days - Roe deer: 1.1 detections / 100 days	
Are numbers of tigers/leopards/prey increasing or decreasing in your project area? Please show trends Increasing (see figures 1, 2, and 4 above).	
Did you carry out other surveys? Y/N No	
If yes: **Please give details**	
Did you carry out patrolling as part of this project? Y/N No	
If yes:	
Do you use Patrol Monitoring software such as SMART? Y/N	

No		
If yes:	**How do you collect data? Handheld devices/paper/other? Please give details?**	
Please provide comparison data on from your patrolling over time		
Please provide data on violations recorded/arrests/successful prosecutions		
Does your project work with local communities? Y/N No		
If yes: (please be as specific as possible and include gender split) **Who?**	**What did you do? Was it successful?**	**How many people did you reach?**
How do you measure the success of this activity? N/A		

Did you carry out educational activities with adults or children? Y/N No		
If yes: (please be as specific as possible and include gender and numbers) **Who?**	**What did you do?**	**How many people reached?**
Have you seen behaviour change from these activities? (Please give details of your results and of how this is measured)		
Did you carry out training activities for any staff/community member on the project? Y/N No		
If yes: (please be as specific as possible and include gender split) **Who?**	**What did you do? Was it effective?**	**How many staff trained? How many others trained?**
How do you measure the effectiveness of this training?		
Did you carry out conflict mitigation activities with community members?		

No		
If yes: **Who?**	**What?**	**How main people did this include?**
Have you seen behaviour change from these activities? (Please give details of your results and how this is measured)		
Were any scientific papers/articles published because of your project? Y/N No		
If so, please give details or provide copies.		