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 Amur Leopards and Tigers in Southwest Primorye, Russia

Grantee Organisation: Wildlife Conservation Society Russia (ANO WCS)

Location of project: Southwest Primorskii Krai, Russian Far East. Land of the Leopard National Park (LLNP) is approximately 43.100 N, 131.200 E

Size of project area (if appropriate): 957.58 km^2	**No of tigers and / or Amur leopards in project area, giving evidence & source:** We have identified 29 Amur leopards and 13 Amur tigers in our study area based on our camera trap monitoring.

Partners: *(Please give details of partners, including communities, academic institutions etc. for this project.*

We have a formal agreement with Land of the Leopard National Park (LLNP) to work within its borders. We also informed the Nezhinoe Naval Hunting Lease of our camera trapping activities on their land (adjacent to LLNP), although legally we are not required to have formal approval to conduct work there.

Project Contact Name: (*main contact via email*)

Dale Miquelle

Email: dmiquelle@wcs.org

Reporting period: August 1, 2019 - January 31, 2020

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.

Section II. Project Results

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

The Wildlife Conservation Society in Russia's (ANO WCS) goal within the context of this project is to ensure a secure future for Amur leopards and tigers in Southwest Primorye and neighbouring lands

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).

of Jilin Province, China. We strive to guarantee that a scientifically robust and reliable method is used to monitor both tigers and leopards so that management decisions can be made with the best possible information for long term conservation.

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

Collectively with staff of the National Park, we have developed reliable estimates of Amur leopards and tigers for the entirety of Southwest Primorye since 2014. These results have demonstrated true growth in both the leopard and tiger populations of this region, as well as increases in prey abundance, providing strong evidence that the increased effectiveness of law enforcement by park inspectors—including use of SMART monitoring system implemented by WCS as part of other projects—has likely played an important role in allowing the expansion of these populations. Without this pattern of strong and long term monitoring in place, we would be unable to objectively gauge the effectiveness of direct conservation interventions for these threatened species.

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

This year, ANO WCS deployed 116 cameras at 60 locations. We tallied 6,988 images of wildlife during the trapping period, and 2,202 photographs were of Amur leopards and 559 photographs were of Amur tigers. Our data analysis revealed 29 leopards and 13 tigers in the 957.58 km^2 study area, or an average leopard density of 1.4 individuals/100 km^2 and an average tiger density of 0.72 individuals/100 km^2.

Importantly, we conduct our fieldwork and data analysis in close collaboration and with direct involvement from staff at LLNP. This cooperative work has resulted in a reliable, statistically-rigorous multi-year dataset on Amur leopard and tiger numbers that can then be used to make conservation management decisions and gauge effectiveness of conservation interventions.

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)*

Objective 1: Continue monitoring in Nezhino and the Northern Sectors of LLNP

Between January 15 - 30, 2019, we deployed 116 cameras at 60 locations. Our team then collected traps between May 15 - 31, 2019. On average, cameras were in operation for 107 days, or 6,114 trap days in total covering 957.58 km^2. We only collected 102 of the 116 camera traps; unfortunately, the remaining 14 were stolen. Please see more details about this obstacle and challenge to the project later in our report.

We tallied 6,988 images of wildlife during the trapping period, and 2,202 photographs were of leopards in 225 trap events and 559 photographs were of tigers in 70 trap events. Based on the results of data analysis in the program ExtractCompare, which provides estimates of population size, 29 leopards and 13 tigers were identified in the study area. Based on the results of data analysis in the program SPACECAP, which provides density estimates, the average leopard density is 1.4 individuals/100 km^2 and the average tiger density is 0.72 individuals/100 km^2.

Other than Amur leopards and tigers, our photographs showed sika deer, badger, and hare as the most commonly-captured mammal species (Table 1).

Common Name	Images
Amur leopard	2,202
Amur tiger	559
Badger	1,160
Sika deer	1,087
Hare	820
Siberian weasel	352
Wild boar	165
Musk deer	62
Fox	55
Leopard cat	50
Brown bear	32
Raccoon dog	26
Asiatic black bear	25
Roe deer	15

Table 1. Number of photos of all mammalian species taken during winter and spring 2019 in LLNP.

In addition to these photograph counts, we now have four years of data over our expanded study area to assess changes in ungulate populations. We use a relative abundance index (RAI) defined as the average number of individuals/100 camera trap days (Figure 1). Sika deer numbers appear to have increased statistically insignificantly from 8.5 ± 3.6 to 11.3 ± 5.0. There may be statistically significant increases in numbers of roe deer and wild boar (Figure 1).
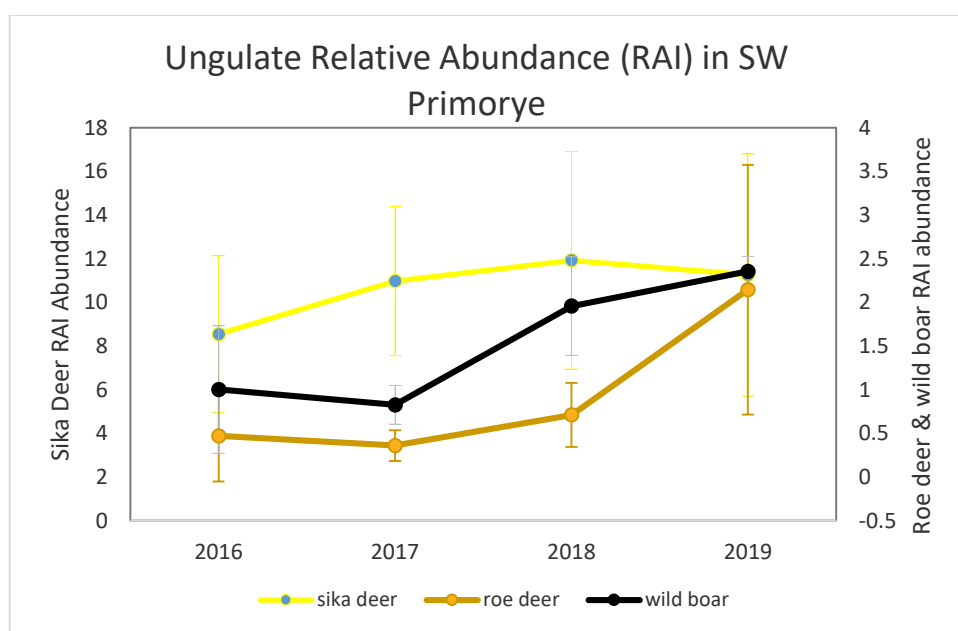

Figure 1. RAI of the three main prey species of tigers and leopards in Southwest Primorye.

Objective 2: Assist LLNP staff to produce park-wide population estimates of leopards and tigers

In autumn 2019, we used Extract/Compare to identify individual Amur leopards in our study area and helped park staff to derive a total count for the park.

LLNP Director Victor Bardyk has now been at the helm of the park for two years, and a new Deputy Director Yuri Darman is a veteran conservationist and experienced at managing projects in charge of LLNP's scientific programs. In early 2019, ANO WCS renewed our official agreements with LLNP under Darman and also began exploring other ways to collaborate with park staff. We continue to be in negotiations with Darman about publishing our joint leopard work.

As stated in our interim report, in July 2019, we attended an International Forum on Tiger and Leopard Transboundary Conservation in Harbin, China. There, Yuri Darman and WCS Russia Director Dale Miquelle discussed options to develop a more stable agreement of joint population estimates by combining data from LLNP and the Northeast China Tiger Leopard National Park (TLNP). WCS continues to work on conservation projects supported by the WildCats Conservation Alliance (WCCA) in these parks that border each other, and where some Amur leopards and tigers occupy territories that straddle both protected areas. Discussions of Sino-Russian collaboration extended to include the scientists conducting monitoring in LLNP. We hope that these talks will lead to better coordination and yearly estimates of the global population of Amur leopards and the Changbaishan population of Amur tigers.

Key achievements of this project: (*Please give a bullet point list of key measurable outputs- for example xxx of staff trained in SMART monitoring techniques, xxx camera traps covering xxx km^2*)

- 116 cameras placed at 60 locations covering 957.58 km^2
- Cameras were in operation for 107 days, or 6,114 trap days in total
- 6,982 total camera trap images in the reporting period, and 2,202 photographs were of leopards in 225 trap events and 559 photographs were of tigers in 70 trap events
- 29 individual leopards and 13 individual tigers were identified after data analysis in ExtractCompare program
- The average leopard density in our study area is 1.4 individuals/100 km^2
- The average tiger density in our study areas is 0.72 individuals/100 km^2
- Relative abundance indices demonstrate increases in all three primary prey species

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*)

As noted above, we did have 14 cameras stolen during this report period. We believe that poachers now know what to look for and are beginning to develop a 'search image' for camera traps. This contrasts against earlier years of our work when the traps were almost never found or stolen. While we now devote significant energy to concealing traps and will continue to do so, these cameras are still sometimes found and taken.

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

We monitor our yearly effort by our ability to successfully set up and recover camera traps with minimum stolen. This year we achieved our goal of setting out 116 cameras; however, given how much effort we put into camouflaging them, we were disappointed that 14 cameras were stolen. Our team is currently analysing our protocols for set up and will attempt to establish better camouflaging techniques and perhaps investigate ways to identify perpetrators.

In the long term, we evaluate our project by how the government and the press uses the information gained through our activities. We are pleased to see that, in contrast to earlier years, media and the government have been using the data derived from our collective effort with the Science Department of LLNP in recent reports. This is in and of itself a great achievement as it indicates that we are achieving the ultimate goal of the project by having the work used as a basis for park and species conservation management.

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

Over the past three years, we have already published two joint scientific articles with Russian scientists of the park and one with both Russian and Chinese specialists, with two examples below:

Matiukhina, D.S., A.V. Vitkalova, A.N. Rybin, V.V. Aramilev, EI. Shevtsova, D.G. Miquelle. 2016. Camera-trap monitoring of Amur tigers (Panthera tigris altaica) in Southwest Primorsky Krai, 2013-2016: Preliminary results. Nature Conservation Research 1 (3): 36–43.

Vitkalova, A.V. L. Feng, A.N. Rybin, B.D. Gerber, D.G. Miquelle, T. Wang, H. Yang, E.I. Shevtsova V.V. Aramilev, J. Ge. 2018. Transboundary cooperation improves endangered species monitoring and conservation actions: A case study of the global population of Amur leopards. Conservation Letters: 11:e12574.

Our team is also in the process of editing a monograph that will cover monitoring across the years 2014 - 2019 for all of Southwest Primorskii Krai. Furthermore, the process of undertaking fieldwork and analyses as a collective of people and organisations consists of another important component of shared learning. Many of the scientific staff of LLNP worked earlier for WCS and learned the importance of rigorous monitoring while on our staff. By continuing to work cooperatively, we can reinforce the need to maintain rigor and scientific validity in the monitoring work that we conduct.

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*)

As in years past, WCS recognized WCCA in the 2019 Annual Report and will do the same for 2020.

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

Have you provided at least 10 high quality images with details of the relevant credit? Y/N? Yes

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:** 6,114	**Total area surveyed:** 957.58 km^2
Numbers of tiger/leopard/prey recorded: 559 photos of tigers/2202 photos of leopards/1267 photos of prey (ungulates)	**Have you included data on other species recorded?** Yes
Did you carry out patrolling as part of this project? Y/N No	
If yes: **Total distance patrolled:**	**Total area patrolled:**
Do you use Patrol Monitoring software such as SMART? Y/N No, not as part of our WCCA funded work, but more broadly yes as we use SMART extensively as part of ANO WCS's work in the Russian Far East.	
If yes: **Total distance patrolled using patrol monitoring software?**	**How do you collect data? Handheld devices/paper/other? Please give details?**

Does your project work with local communities? Y/N No		
If yes: (please be as specific as possible) **Who?**	**What did you do?**	**How many people did you reach?**
How do you measure the success of this activity?		
Did you carry out educational activities with adults or children? Y/N No		
If yes: **Who?**	**What did you do?**	**How many people reached?**
Have you seen behaviour change from these activities? (Please give details 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) **Who?**	**What did you do?**	**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 how this is measured)		
Were any scientific papers/articles published because of your project? Y/N Yes		
If so, please give details or provide copies. Matiukhina, D.S., A.V. Vitkalova, A.N. Rybin, V.V. Aramilev, EI. Shevtsova, D.G. Miquelle. 2016. Camera-trap monitoring of Amur tigers (Panthera tigris altaica) in Southwest Primorsky Krai, 2013-2016: Preliminary results. Nature Conservation Research 1 (3): 36–43. Vitkalova, A.V. L. Feng, A.N. Rybin, B.D. Gerber, D.G. Miquelle, T. Wang, H. Yang, E.I. Shevtsova V.V. Aramilev, J. Ge. 2018. Transboundary cooperation improves endangered species monitoring and conservation actions: A case study of the global population of Amur leopards. Conservation Letters: 11:e12574		

Final Financial Report to the WildCats Conservation Alliance
Monitoring Amur Leopards and Tigers in Southwest Primorye, Russia

Grant Period: February 1, 2019 - January 31, 2020
Report Period: August 1, 2019 - January 31, 2020
WCS Reference: 111488 / 2RU81

Category/Budget Item	Cost Breakdown	Unit Description	Cost per Unit (GBP)	No. Units	Frequency	Total cost	WildCats Requested Funding (GBP)	Other Funding Applied (GBP)	Other Funding Secured (GBP)	Year 1 Costs	Previous (Feb 1, 2019 - Jul 31, 2019)	New (Aug 1, 2019 - Jan 31, 2020)	Total
Personnel													
Team Leader	1 person/1.0FT/1 yr	Monthly salary for 1 FT member of staff for 1 year	1,155	1	7	8,085	8,085	0	0	8,085	6,301	2,017	8,318
Senior Field Assistant	1 person/1.0FT/1 yr	Monthly salary for 1 FT member of staff for 1 year	1,155	1	3	3,465	3,465	0	0	3,465	1,683	150	1,833
Data Management Specialist	1 person/1.0FT/1 yr	Monthly salary for 1 FT member of staff for 1 year	1,344	1	3	4,032	4,032	0	0	4,032	4,424	1,423	5,847
		Subtotal				15,582	15,582	0	0	15,582	12,408	3,590	15,998
Operating Expenses													
Office rent for field office	month/1 month	Office rental cost for 1 month	924	1	1	924	554	0	370	924	0	302	302
		Subtotal				924	554	0	370	924	0	302	302
Field & local travel Expenses/Rations													
Fuel for vehicles	Fuel for 4 months of fieldwork @ 400 liters/month and 1 L = $1	Montly fuel allotment (litre)	0.8	400	4	1,232	1,232	0	0	1,232	1,536	-619*	917
Vehicle repair costs and purchase of tires	1 vehicle/year	Expenses based on previous years	6,160	1	1	6,160	3,080	0	3,080	6,160	1,659	1,405	3,064
		Subtotal				7,392	4,312	0	3,080	7,392	3,195	786	3,981
Field Equipment/Rations													
Batteries for Camera Traps (12 needed per trap)	128 traps/1 yr	AA lithium batteries	12.0	128	1	1,536	1,536	0	0	1,536	0	1,727	1,727
Memory Cards (SD) for Camera Traps	18 traps/1 yr	Supplemental card to replace lost or damaged units	7	18	1	126	126	0	0	126	19	23	42
		Subtotal				1,662	1,662	0	0	1,662	19	1,750	1,769
Other Costs (Miscellaneous)													
Per diem for fieldworkers	2 workers/day/30 days	daily rate (per diem) for two assistants to carry and set up camera traps for 30 days	8	30	2	480	480	0	0	480	349	191	540
		Subtotal				480	480	0	0	480	349	191	540
		Grand Total				26,040	22,590	0	3,450	26,040	15,971	6,619	22,590

*Previously reported expense figure in 'Fuel for vehicles' had an error in our interim report. The Total WildCats Supported Expenses line thus shows the correct amount incurred over the grant's lifetime.