

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

Redacted version.

Section I. Project Information	
Project Title: Monitoring Amur Leopards and Tigers in Southwest Primorye, Russia	
Grantee Organisation: Wildlife Conservation Society (WCS) Russia	
Location of project: Southwest Primorskii Krai, Russian Far East. Land of the Leopard National Park (LLNP) is approximately 43.100 N, 131.200 E.	
<p>Size of project area (if appropriate): WCS conducts independent camera trapping in the northern and central sectors of Land of the Leopard National Park (LLNP), an area of slightly less than 1,000 km². Our work is part of the annual region-wide estimates of leopard and tiger numbers over Southwest Primorye, with an “effective survey area” that varies between 5,000 and 6,000 km², depending on annual variation in placement of camera traps.</p>	<p>No of tigers and / or Amur leopards in project area, giving evidence & source: We estimated a global population of 84 adult/subadult Amur leopards in 2014-2015. Between 2014 and 2019, the total number of adult/subadult leopards identified during a 90-day survey period only in LLNP has ranged from 47 (2014) to 84 (2018) (Vitkalova et al., unpubl.).</p> <p>Between 2014 and 2018, the total number of adult/subadult tigers in LLNP ranged from 21 (2014) to 29 (2018) (Vitkalova et al., unpubl.)</p>
<p>Partners: <i>(Please give details of partners, including communities, academic institutions etc. for this project.</i></p> <p>WCS has a formal agreement with LLNP to work within its borders and to survey leopards and tigers in the northern region of the national park, as part of the park-wide annual survey. We also inform 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 work there. To best orchestrate a transboundary camera trap database, we try to coordinate activities in China through WCS China and their contacts with Hunchun Nature Reserve (HNR) and the larger Northeast Tiger Leopard National Park (TLNP). However, recently, exchanges of information have not occurred.</p>	
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Reporting period: July 1, 2020 - January 31, 2021	

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?)*

We have sought to institutionalize rigorous methods of population monitoring in the Russian Far East for nearly twenty years, and continue to make strides. Given that the current official estimates of tiger abundance in Russia are still based on expert assessments, demonstration of proper survey design, methods, and analyses are still critical. We believe that population monitoring with accurate estimates of abundance and density are essential to demonstrate real recovery (or decline) of endangered species and to avoid development of a false narrative of recovery for political purposes. We work with partners (both government and NGO) to ensure that rigorous, repeatable methods are used across the range of leopards and tigers in Russia.

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

Amur leopards and tigers are not only Endangered subspecies; they are also highly political objects in both Russia and China. Consequently, the need for quality methodologies and analyses to understand population dynamics is of paramount importance. WCS seeks to ensure that high-quality methods and analyses are consistently used to assess population size and trajectory. This positioning allows us to help guide LLNP management, and provides an example of how to properly estimate tiger abundance. These activities also demonstrate our strengths as a science-based conservation organization, which helps us negotiate and be engaged in transboundary conservation activities.

These evidence-based survey methodologies have allowed us to demonstrate that leopard numbers have increased over the past five to ten years in Southwest Primorye, which is a testament to improved law enforcement efforts and better management coming after the creation of Land of the Leopard National Park. The collective results demonstrate that recovery of tigers and leopard numbers is possible in northeast Asia when appropriate and dedicated management efforts are applied, and are a testimony to the value of dedicated monitoring efforts.

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

During the grant period, WCS Russia successfully conducted population monitoring of Amur leopards and Amur tigers across a nearly 1,000 km² study area in Southwest Primorye, Russia. This effort resulted in 1,416 images of 90 capture events of 24 different Amur leopards, and 757 images of 90 capture events of 19 adult tigers. Our long-term data set shows that leopard and tiger numbers are slowly increasing in this region, as are numbers of sika deer—their primary prey.

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 monitoring in Nezhino and the Northern Sectors of LLNP.

Activity 1.1. Deploy cameras.

For the 2020 season, we began deploying camera traps on 14 January 2020, and finished on 29 January. We set up 51 pairs of cameras that engulfed a 763.76 km² study area polygon (34 pairs in the Southern (or “Nezhino”) Sector and 17 in the Northern Sector).

For the 2021 capture season, we set 62 pairs of cameras from 13 January-09 February, 2021. This deployment was considerably longer than usual (for example, in 2020), due to an ice storm that coated much of the study area—including the steep slopes—in thick ice making travel exceedingly difficult. Because of conditions, we were forced to halt operations until appropriate crampons could be located and purchased, allowing our team to work here safely. These cameras will be collected in May 2021 and results reported on next year.

Activity 1.2. Collect cameras.

Traps for the 2020 season were removed from 21-27 May 2020. In total, we received data from 47 locations (instead of the 51 where cameras were deployed as some cameras were stolen).

Activity 1.3. Analyse data.

From 14 January to 27 May 2020, our camera traps were deployed for 5,337 trap nights. This resulted in 1,416 images of 90 capture events of 24 different Amur leopards. With respect to Amur tigers, our traps revealed 757 images of 90 capture events of 19 adult tigers (see Figure 1). From 2003-2020 we have recorded a total of 88 adult leopards and 53 adult tigers in the study area.

These numbers of leopards and tigers are not the highest we have recorded in our study area, but are in line with observations that since 2014, we have witnessed increases in numbers of leopards and tigers counted in our study area (Figure 1), compared to earlier years. Part of this change is obviously due to the fact that we increased the area surveyed in 2014. Yet, beyond that, we see that even looking just within this expansion area, both tiger and leopard numbers have demonstrated position growth since 2014 (Figure 1).

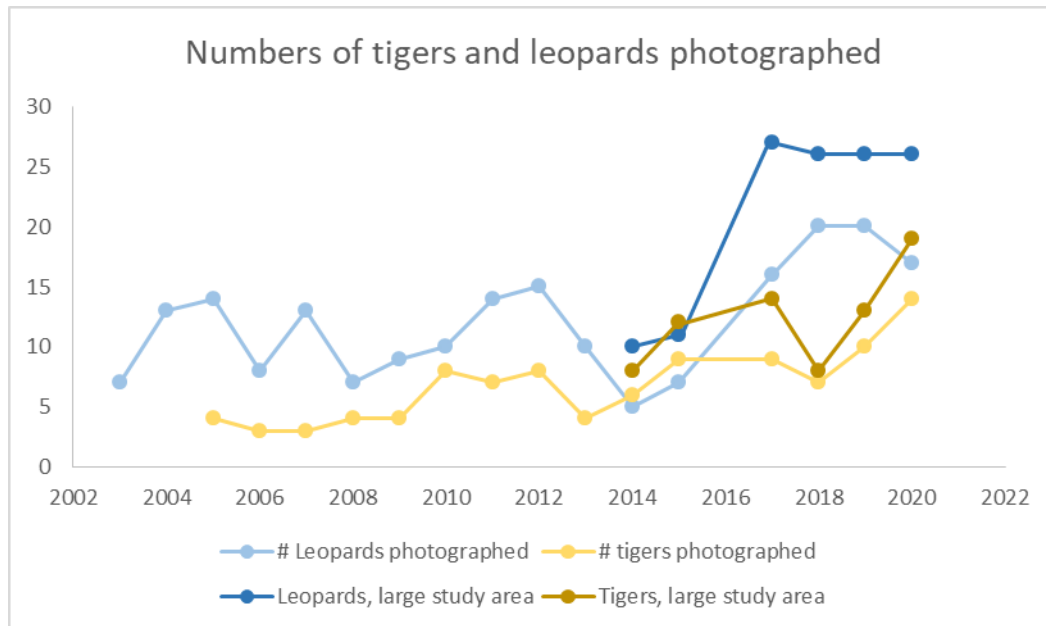


Figure 1. Number of Amur leopards and Amur tigers photographed over time in Southwest Primorye. Note that we expanded to a larger study area in 2014, but that expanded effort alone does not account for population increases.

This conclusion is supported by the results of density estimates. Based on the results derived from the program SPACECAP, the average leopard density in 2020 was 1.4 ± 0.2 individuals/100 km² and the average tiger density was 1.17 ± 0.2 individuals/100 km². In comparison to earlier years, these data support the trends seen with leopard numbers; density of leopards has also increased in our study area over the past six years (Figure 2), whether we look at the total area, or only the original, smaller area we have surveyed since 2002.

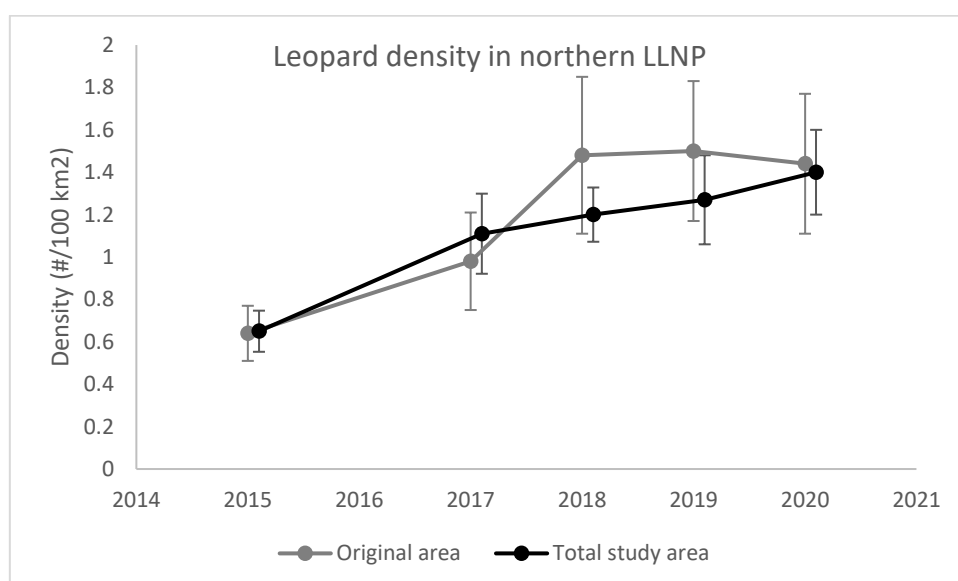


Figure 2. Density (individuals/100 km²) of Amur leopards in northern Land of the Leopard National Park, 2014-2020, shows a significant increase over time.

In addition to these photographic counts of big cats, we now have six years of data (2015-2020) 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 photographed/100 camera trap days (Figure 2). Sika deer—the most important prey for leopards and tigers in the study area—appear to have increased statistically significantly from 6.11/100 trap days in 2015 to 16.18/100 trap days in 2020. Roe deer, which appear to be outcompeted by sika deer in the Russian Far East, unsurprisingly have not increased in the face of an increasing sika deer population (Figure 2). Wild boar numbers have fluctuated more than roe deer (as is typical for wild boar populations) but also remained low. However, collectively, these data suggest that total prey availability has increased since 2015, thereby supporting the larger tiger and leopard populations.

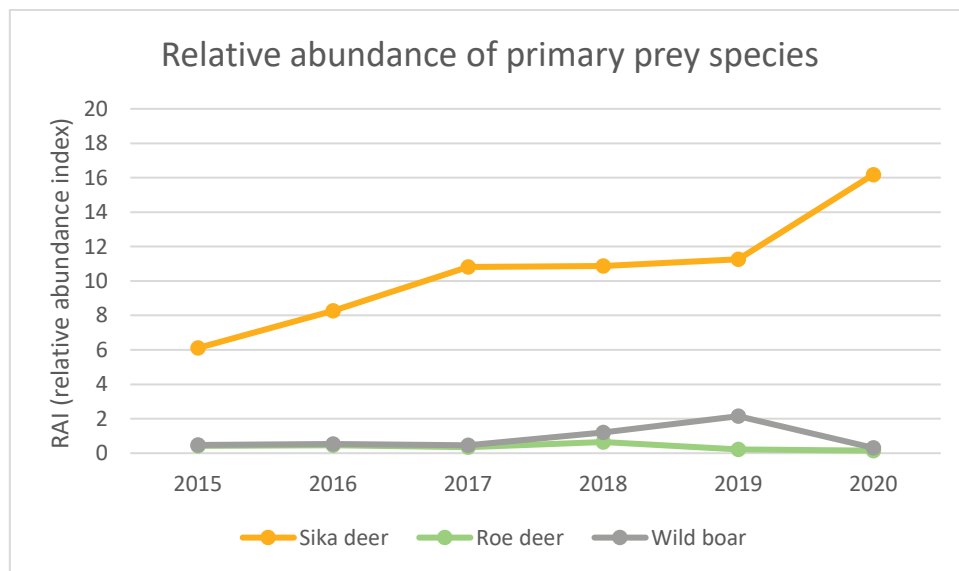


Figure 3. RAI of the three main prey species of tigers and leopards in Southwest Primorye.

Population estimates for the entire region (from Vitkalova et al., in press) also demonstrate that leopard numbers have been increasing, at least since 2014, and possibly earlier. This monitoring system has allowed us to scientifically document this increase in leopard and tiger density and numbers. Our work with SMART in LLNP has also allowed us to demonstrate increased anti-poaching efforts, and decreasing poaching levels inside the national park (Hotte et al. 2015), providing strong evidence of a correlation between law enforcement efforts and recovery of tigers, leopards, and their prey.

Other Species. We recorded a total of 14 species of mammals at camera trap sites (Table 1). We do not include bird species or rodents in our database, so this list mostly represents small carnivores, ungulates, and large carnivores. Sika deer were the most commonly “captured” species, followed by badgers. Given that cameras were placed to maximize probability of leopard captures, it is not surprising that leopards were the third most commonly captured species, even though their abundance is certainly less than other species on the list. The abundance of brown bear photographs is of interest, given that they are close to the edge of their global southern range here in Southwest Primorye.

Table 1. Number of photos of all mammalian species taken during winter and spring 2020 in LLNP.

Species	Number of photos	Number of "captures"
Amur leopard	1416	324
Sika deer	1395	613
Amur tiger	793	172
Badger	514	488
Hare	324	319
Red fox	48	44
Siberian weasel	36	31
Wild boar	26	15
Brown bear	23	23
Musk deer	21	16
Amur leopard cat	19	16
Himalayan black bear	16	8
Roe deer	12	11
Otter	6	2
Raccoon dog	5	4
Total	4654	2086

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

Activity 2.1. Produce park-wide leopard populations estimates.

Vitkalova et al. (unpubl. report) indicated that the total number of leopards (adults & cubs) photographed in southwest Primorye has increased from 53 in 2014 to 86 in 2019 (with a peak of 98 in 2018). Details of these estimates will be published jointly in the near future. Overall, these results also support the conclusion that leopard and tiger numbers have increased in Southwest Primorye, and more specifically in LLNP.

Objective 3. Facilitate Russia-China data sharing.

Activity 3.1. Work with Russian and Chinese governments to share data.

Despite repeated discussions and efforts to build a framework for data sharing, we have not been successful in duplicating earlier efforts that resulted in a global estimate of the Amur leopard population. The creation of the Northeast China Tiger and Leopard National Park in adjacent China should have facilitated better cooperation and coordination, but so far the administration of the park is still evolving, with many gaps remaining. There is also a reluctance about transboundary data sharing by some of the scientists. We continue to engage in these discussions but until there is some strong leadership from the new Chinese national park, it will be difficult to make progress here.

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 km²)*

- Cameras collected from 47 locations covering 763.76 km²
- Cameras were in operation for 133 days, or 5,337 trap days in total
- 4,654 total camera trap images in the reporting period, and 1,416 photographs were of leopards in 90 trap events and 757 photographs were of tigers in 90 trap events
- 24 individual leopards and 19 individual tigers were identified after data analysis in ExtractCompare program
- The average leopard density in our study area was 1.4 individuals/100 km²
- The average tiger density in our study areas was 1.17 individuals/100 km²
- Relative abundance indices demonstrate increases in the primary prey species – sika deer
- Our collaborative scientific monitoring system successfully documented a real increase in numbers and density of leopards and tigers (as well as the primary prey species) in Southwest Primorskii Krai. In concert with the SMART law enforcement monitoring system we helped install, the data provide correlative evidence of improved law enforcement and reduced poaching levels, which combined with improved overall management that came with creation and financial support of the national park, paved the way for recovery of tigers and leopards.

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)*

This section redacted for confidentiality purposes.

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

First, we monitored our progress based on our ability to deploy the target number of camera traps within the target deployment period, and the timely collection of units from the field. We have done this for many years now and this year was no exception. While we did lose some traps to thieves, the loss was minimal and we have taken steps to reduce future losses. Next, we evaluated our successes by the number of leopards and tigers we captured on camera, and in deriving a population estimate for our study area that we can compare to past years. This is only possible as the result of multi-year, sustained support from WCCA.

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

We produced a 2020 annual report in cooperation with LLNP staff that was shared with the Russian Ministry of Natural Resources. We have worked in collaboration with staff or LLNP in the preparation of a publication on results of tiger and leopard monitoring since 2014. This document should be published in 2021 (although initially only in Russian). Additionally, when possible we also publish our findings in peer-reviewed journals and regularly share our findings with the public.

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)*

One joint publication (in Russian) is in press based on the results of this monitoring.

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 (5 with the interim report and 5 with the final report)

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: 5,337	Total area surveyed: Camera trap polygon = 763.76 km ²
Numbers of tiger/leopard/prey recorded 19 tigers and 24 leopards	Please include data on other species recorded see Table 1 above
Are numbers of tigers/leopards/prey increasing or decreasing in your project area? Please show trends Please see Figures 1, 2 and 3 above, which show increases in numbers and density of leopards, tigers, and sika deer over time.	
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, 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: (please give figures for different methods, vehicle/foot/boat etc)		Total area patrolled:	
Do you use Patrol Monitoring software such as SMART? Y/N Yes, but not as part of this project			
If yes: Total distance patrolled using patrol monitoring software?		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?			
Did you carry out educational activities with adults or children? Y/N No			

<p>If yes: (please be as specific as possible and include gender and numbers)</p> <p>Who?</p>	<p>What did you do?</p>	<p>How many people reached?</p>
<p>Have you seen behaviour change from these activities? (Please give details of your results and of how this is measured)</p>		
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<p>Did you carry out training activities for any staff/community member on the project? Y/N No</p>		
<p>If yes: (please be as specific as possible and include gender split)</p> <p>Who?</p>	<p>What did you do? Was it effective?</p>	<p>How many staff trained? How many others trained?</p>
<p>How do you measure the effectiveness of this training?</p>		
<p style="background-color: #d9ead3; height: 44px;"></p>		
<p>Did you carry out conflict mitigation activities with community members? No</p>		
<p>If yes:</p> <p>Who?</p>	<p>What?</p>	<p>How main people did this include?</p>
<p>Have you seen behaviour change from these activities? (Please give details of your results and how this is measured)</p>		
<p style="background-color: #d9ead3; height: 44px;"></p>		



Were any scientific papers/articles published because of your project? Y/N One joint publication (in Russian) is in press on the results of this monitoring program, 2014-2019.

If so, please give details or provide copies. When available, we will share.