

Final Report



1. CLP project ID & Project title	03292116; Corridor Capacity Building Program in Northeast China for Amur Leopard
2. Host country, site location and the dates in the field	China; Huangnihe Nature Reserve/Hunchun Nature Reserve; 90-100 days in the field
3. Names of any institutions involved in organising the project or participating	Local forestry department: Huangnihe Nature Reserve, Hunchun Nature Reserve; NGO: WCS, Tiger and leopard Fund in Korea; Local community (Xibeicha forestry station); Local school (No.2 High school of Hunchun)
4. The overall aim summarised in 10–15 words	Aiming for Amur leopard habitat expansion to potential habitats
5. Full names of author(s)	YING LI, Hee Kyung RYOO, Hailong LI, Qing LI
6. Permanent contact address, email and website	Room 803, Building 85, Seoul National University; shadowlee156@163.com; 23484530@qq.com
7. Date which the report was completed	2018-3-31

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Project Partners & Collaborators

Please list and acknowledge all of the project's collaborators, including individuals, organisations and government departments. Please provide a brief description of how each was involved in the project.

Section 1:

Summary (max 200 words)

The summary should be written concisely, summarising the entire report with a statement on each of the following: project aim, objectives, key results, main impacts. If project or progress was different to that expected, brief details should be given here.

Our project focuses on amur leopard habitat corridor for expanding their current distribution to the potential habitat.

We tried to identify the leopard population and local community's attitude towards wildlife to get baseline information for conservation strategy and to enhance the capacity of the corridor area for leopard to use.

Within a year of research, we conducted camera trapping and snow tracking in order to get information about current leopard population status in our research area. 11 camera traps were installed in Huangnihe and 40 in Hunchun, and 126.2 km long transact routes were surveyed. 100 local community households (27 villages) were interviewed in regard to their livelihood, attitude towards wildlife as well as the attitude towards wildlife conservation.

The result shows that south west of Hunchun has a high potential of accommodating leopard as their habitat corridor. In terms of local people's attitude toward wildlife and conservation, people's income and education level are the most significant factors that influence people's attitude. This can be used wisely to establish conservation strategy to solve conservation problems in the area.

Introduction (max 500 words)

Keep the introduction short and include a brief section on each of the following:

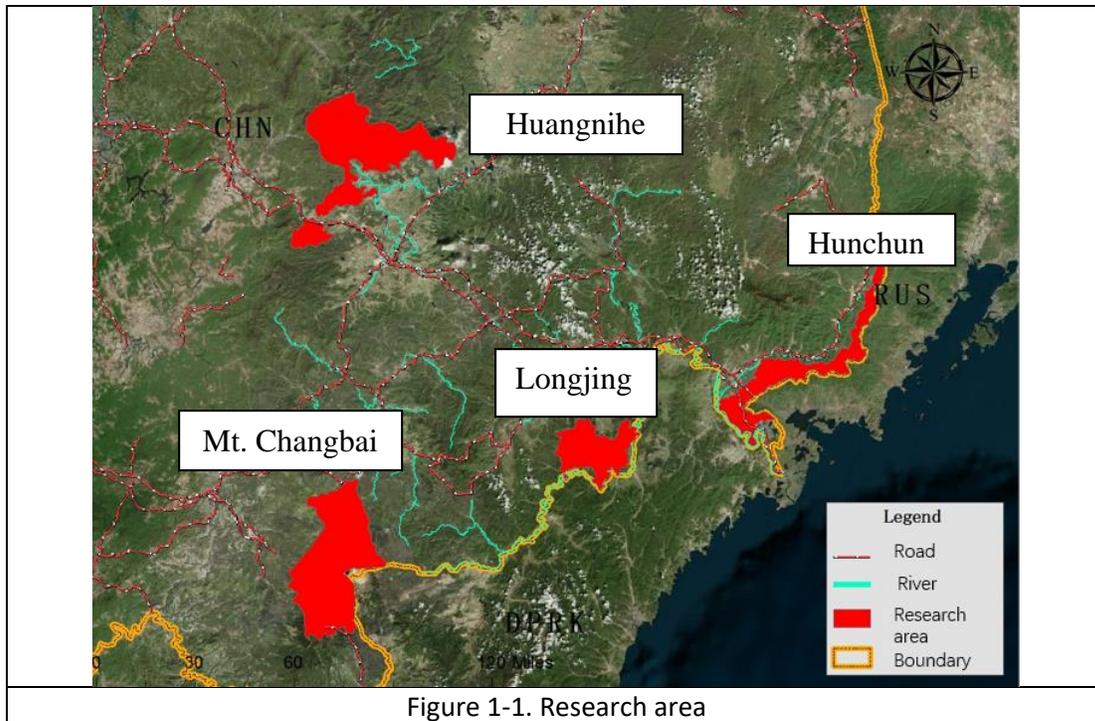
- *The conservation value of the project work*
- *The conservation problem and issues addressed*
- *Background to the project site and its conservation significance*
- *Identify the key partners and their role*
- *Include a map of the area*

Our project focuses on Amur leopard which is the most endangered leopard subspecies in the world. They are currently surviving in the forest area at the boundary area of China, Russia and North Korea. The biggest threat that the leopard face is the limited habitat disabling them from having sustainable population (Check E. 2006; Yu TIAN et al. 2009). The previous research showed there is still reasonably decent habitat for amur leopard in Changbai mountain area in China, which can be an ideal habitat for them in the future (Zhenxin LI et al. 2010).

The problem is how to get there and to settle there. Thus, our project focused on the significant dispersal areas where amur leopard can use to reach Changbai Mountain. We tried to identify the leopard population habitat use and local community's attitude towards wildlife to get baseline information for conservation strategy and to enhance the capacity of the corridor area for leopard to use.

This is the first time for camera trapping method has been used in these two areas. Presumably, Huangnihe, as an inner corridor, can be used for leopards to disperse toward Changbai Mountain as well as to Jingxin-Banshi area which is a natural corridor that connects Russia, China and North Korea.

We worked closely with the local conservation groups including local forestry department who supported us on the field survey as attaining permission before the forest investigation is an essential procedure. For camera trapping investigation, we partly collaborated with WCS tiger project members in Hunchun. Our most important partner was the local community people who currently are using and will use resources from forest and experience constant interaction with wildlife living in the forest.



Project members

List the project members, giving brief details of their relevant qualifications, experience, current occupation and employer, and their main roles in the project. Where relevant give an indication of the age group.

Name	Qualification	Experience	Occupation	Role
Ying LI (32)	PhD. Student in Seoul National majoring in wildlife conservation	WCS China project previous staff;	Co-founder of Sustainable Conservation Network China	Team leader
Hee Kyung RYOO (31)	Master's degree in landscape ecology in Seoul National University	Export-Import Bank of Korea; Global Green Growth Institute	Co-founder of Sustainable Conservation Network China	Education organizer
Hailong LI (34)	PhD. Student in Seoul National majoring in wildlife conservation	Hunchun Tiger National Nature Reserve previous staff	Chinese Tiger and leopard National park	Field research

Section 2:

Aim and objectives (max 200 words)

Provide a statement of the main aim and underlying objectives of the project as described in initial project outline or explain any changes or adaptations to the original statement.

Our research and education were aim to enhance network and corridor functioning between Hunchun and Changbai for leopard to disperse in the historical range of Changbai Mountain area.

Our initial project objectives were:

1. Estimating leopard population and prey density in target area using camera trapping method and field survey during one year's monitoring.
2. Drawing human activity and habitat interaction map in the study area using questionnaires and field surveys within two months of the project start date.
3. Teaching the local community people knowledge of wildlife through workshops and school activities (conducting pre- and post-questionnaire surveys to monitor the training effectiveness)

After discussing with more researchers and experts during CLP training, we changed our objectives as following, judging that the following can be more effective in achieving project goals.

1. Understanding leopard status in the targeting corridor area by knowing their distribution and habitat use.
2. Getting prey animal density information in the targeting corridor area
3. Investigating habitat quality concerning the human activities and their influences by using questionnaire and field survey.
4. Raising awareness of local people towards wildlife

Changes to original project plan (max 200 words)

Please give details of any changes to the original project plans, including any objectives that were not fully delivered and explain how this impacted the delivery of the project. Describe how any problems were addressed and what solutions were found to deal with these issues.

Most significant change in our project plan is project schedule. Since we had limited information about local people's working schedule, we needed to delay our workshop. Most of the local people are farmers, and people were occupied from early spring to fall

season. Thus, we needed to reschedule our workshop at the end fall when most of their farm works were completed.

Also, after we figure out there's so much human activities in the forest, we needed to adjust our camera setting period in order to avoid stealing cameras.

At the end of the day, all of our objectives were accomplished, and we learned how to design project in a realistic manner.

Methodology (max 500 words)

For each objective please describe in concise and specific statements all project methodologies. Including any relating to ecological and social science research, as well as activities involving project stakeholders such as education & outreach, livelihoods, policy or capacity building. This section should provide adequate detail so as to enable the study to be repeated.

1. Camera trapping

We installed 51 cameras in Jingxin-Banshi and Huangnihe area.

In 20 sites of 200 km² of Jingxin-Banshi area, two cameras in each site were set to capture both sides of passing animals. In 11 sites of 160 km² of Huangnihe area, on the other hand, one camera was installed in each site as relatively low number of leopard visit the area, and we needed to make most out of our limited number of cameras.

Cameras in Jingxin-Banshi were set up in November 2016, and withdrew in April 2017, and average working time for each camera is 145 days. 3 cameras had technical problem and 1 camera was not able to retrieve for boundary area management issue. Cameras in Huangnihe were set up in early September 2016, and withdrew in April 2017, and average working time is 217 days (1955 of total working day).

Leopard individuals were identified by their shape, size and location of pelage rosettes.

2. Stratified sampling line transect survey

We conducted transact in 25 different areas, and the total length of the survey transect is 199.9 km. We designed transacts with wildlife information we collected, and the research environment was concerned as well.

For species distribution, a method known as Formozov (Mirutenko, 1986) or Formozov–Malyshev–Pereleshin (FMP) formula (Kuzyakin, 1983) was used to estimate species density with indirect signs of wildlife. The main idea is calculating density from encounter probability with wildlife tracks and survey transects.

$$D = \frac{\pi x}{2 S \bar{M}}$$

Where x is the number of fresh tracking, S is total length of transect, and \bar{M} is average length of daily movement. We used our survey data for the value x and S, and used reference data for the average daily movement (Changzhi ZHANG 2013, Stephens et al.

2006), the value of \bar{M} . Roe Deer's daily movement is 0.89 km, wild boar is 3 km, red deer is 1.29 km, and sika deer is 2.78 km

3. Habitat uses

With camera trapping data, we came up with spatial distribution map showing species abundance by using Relative Abundance Indices which represents time to get one species detected (RAI_1) (Carbone C, et al. 2001) and the number of detection per day (RAI_2).

GIS was used to map wildlife habitat use with different layers of index; land-use data as background, wildlife abundance index that we drew from camera trapping and snow survey. The result can illustrate hot spots in the corridor area with further research and management.

4. Community's awareness to wildlife

In order to figure out the relationship between human wildlife, household survey was conducted asking questions in regard to local people's basic ethnics, income, main activities, interaction with wildlife, and preference to wildlife living nearby, based on the hypothesis that people's income or education level would influence their attitude.

27 villages were selected by using simple random sampling from a statistical book with Yanbian village code in it (sampling frame). The main survey was conducted after testing survey.

For statistical analysis, we used Pearson product-moment correlation coefficient to calculate the correlation between all independent variables (age, sex, religion, education, income, economic activities) and dependent variables (attitude toward wildlife).

5. Wildlife education

The aim for the wildlife conservation education program was to share basic information about wildlife around local people's environment.

In Huangnihe, we had 22 participants from Nature Reserve and local forestry station. Four different activities were conducted; community engagement activity, wildlife encounter training, lesson for basic ecology, and watching wildlife documentary film.

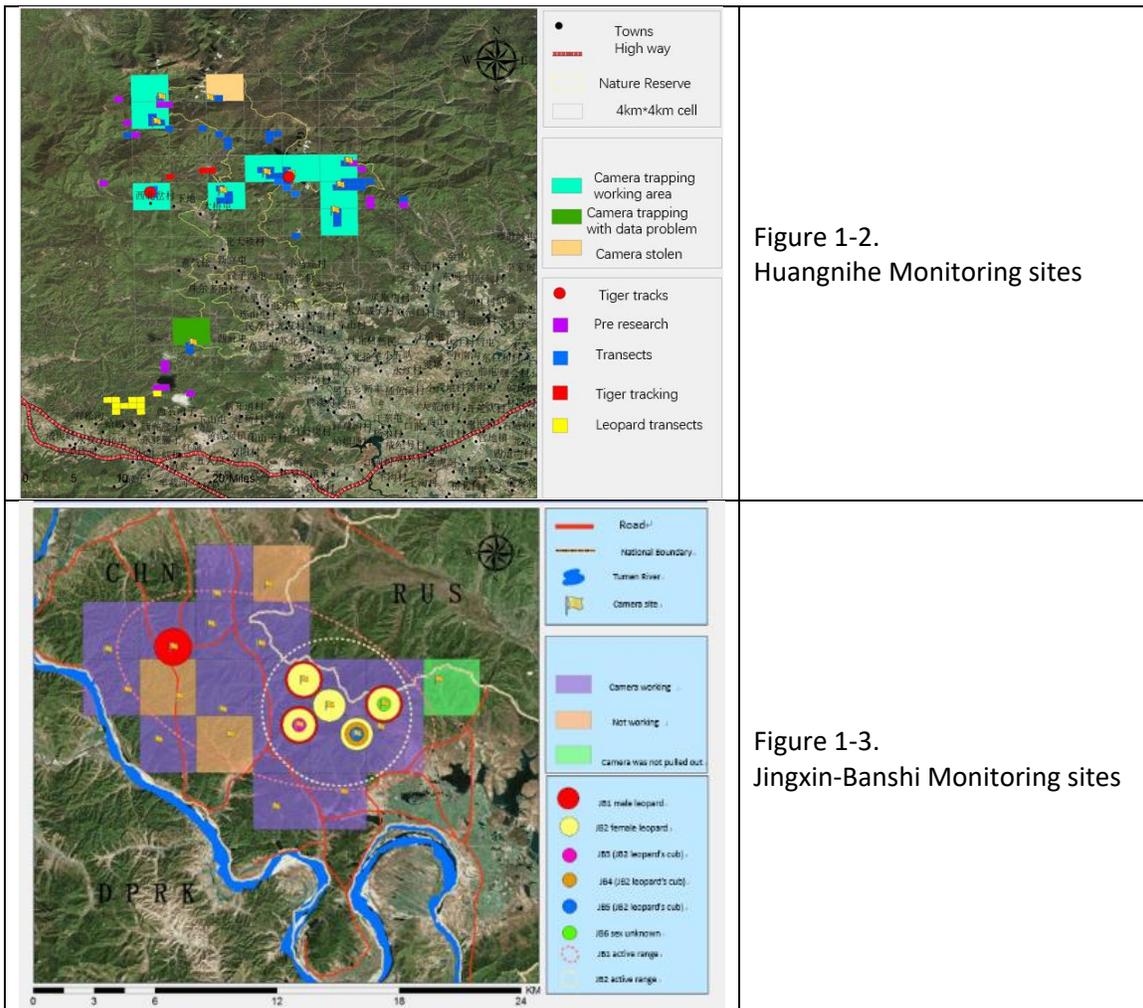
In Hunchun, we had 24 Korean-Chinese high school students as participants with 3 teachers as assistants. Considering the situation that students are not familiar with such environmental education, we focused on delivering basic idea of ecology and letting them enjoy the class through simple lecture and a game.

Outputs and Results (max 500 word)

For each objective please provide details of all the quantifiable results of the project's activities. For quantifiable research outputs of you should include presentation and data analysis of the results, with tables and graphs to summarise where suitable. For quantifiable outputs of activities involving stakeholders you should include, for example, the number of publications or posters and their distribution, the number of workshops and participants, the number of stakeholders engaged, evidence of behaviour change, funds raised etc. Include photos where appropriate.

1. Understand leopard status in the targeting corridor area by knowing their distribution and habitat use.

Through camera trapping and snow tracking, we collected leopard (and some tiger) distribution information (Figure 1-1 and 1-2).



During the project period (over 240 days), 28 photographs and videos of 6 individuals of leopard and 10 other mammals were recorded. Of the 6 leopards, one male, a female with three cubs, and an unknown sex. We identified them as JBL1 (male), JBL2 (female), JBL3, 4, 5 (cubs), JBL6 (unknown).

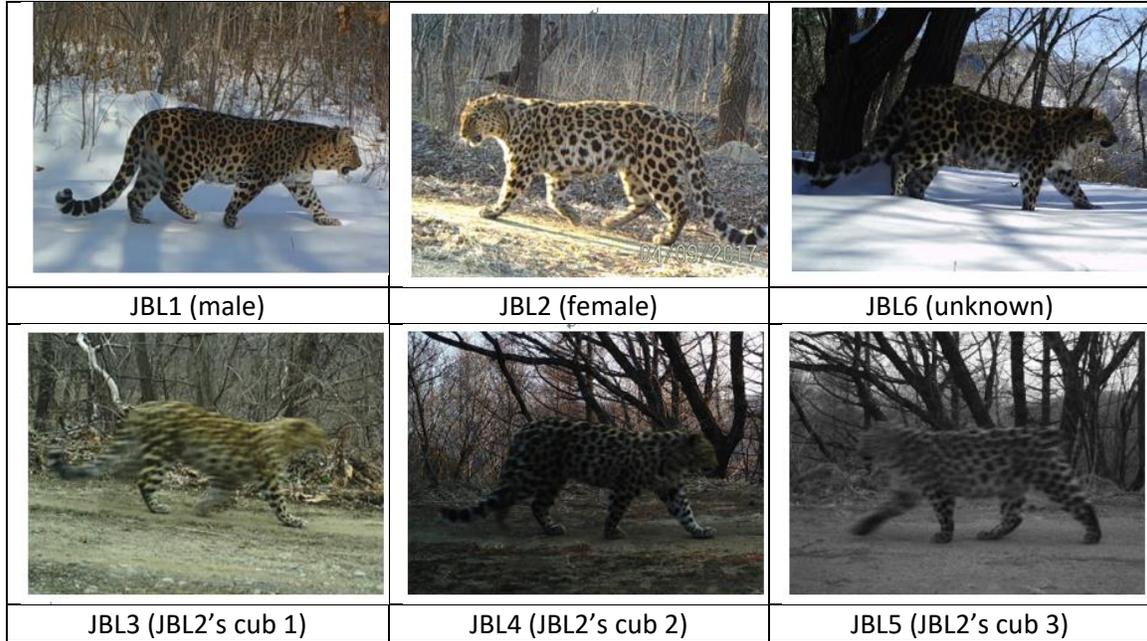


Figure1-4. leopard captured photo

2. Get the prey animal density information in the targeting corridor area

Table 2-1 and 2-2 show the density of prey animal in the research area based on the calculation of Formozov–Malyshev–Pereleshin (FMP) formula. It's difficult to further explain about prey density in the corridor area with one year of monitoring data, and further monitoring and research are needed.

Table 2-1. Ungulate density in Changbai Mountain:

	Roe deer	Wild boar	Sika deer	Red deer
Density	4.46	0.60	0.24	0.54

Table 2-2. Ungulate density in Longjing area:

	Roe deer	Wild boar
Density	4.23	0.32



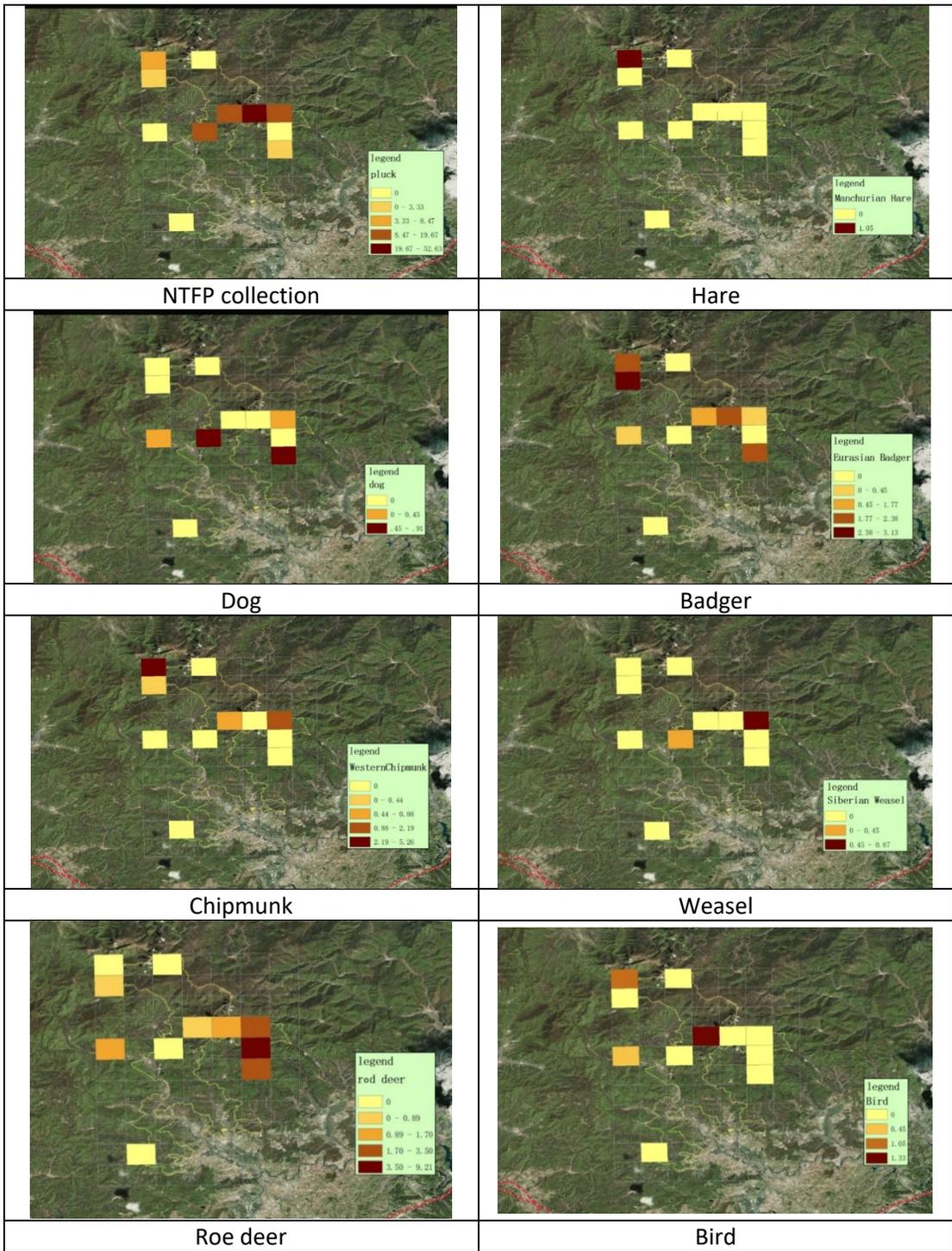
Figure 2-1 Information was collected and recorded during snow track survey

3. Investigate habitat quality concerning the human activities and their influences by using questionnaire and field survey.

We came up with following spatial abundance index maps through RAI. The map can be useful to identify important path which requires further management.

Table 3-1 RAI value on different detections (Huangnihe)

Detection	No	RAI ₁ (day/detection)	RAI ₂ (detection/100days)
Human	81	24.14	4.14
NTPF	34	57.50	1.74
Dog	6	325.83	0.31
Cow	34	57.50	1.74
Manchurian Hare	1	1955.00	0.05
Asian Badger	27	72.41	1.38
Chipmunk	13	150.38	0.66
Squirrel	59	33.14	3.02
Weasel	13	150.38	0.66
Yellow-throated marten	3	651.67	0.15
Sable	22	88.86	1.13
Red deer	17	115.00	0.87
Roe deer	47	41.60	2.40
Wild boar	38	51.45	1.94
Lynx	1	1955.00	0.05
Bird	5	391.00	0.26



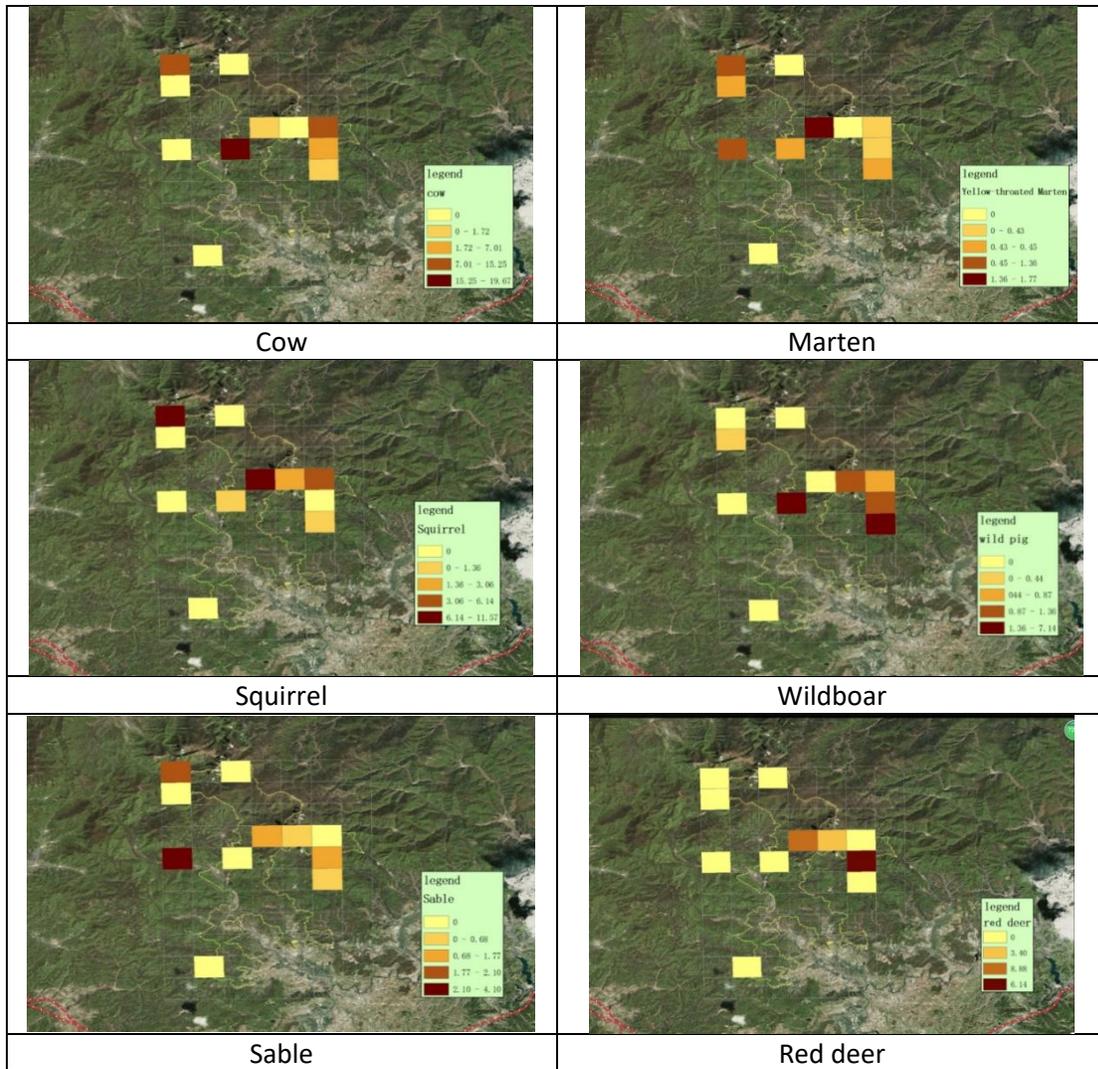
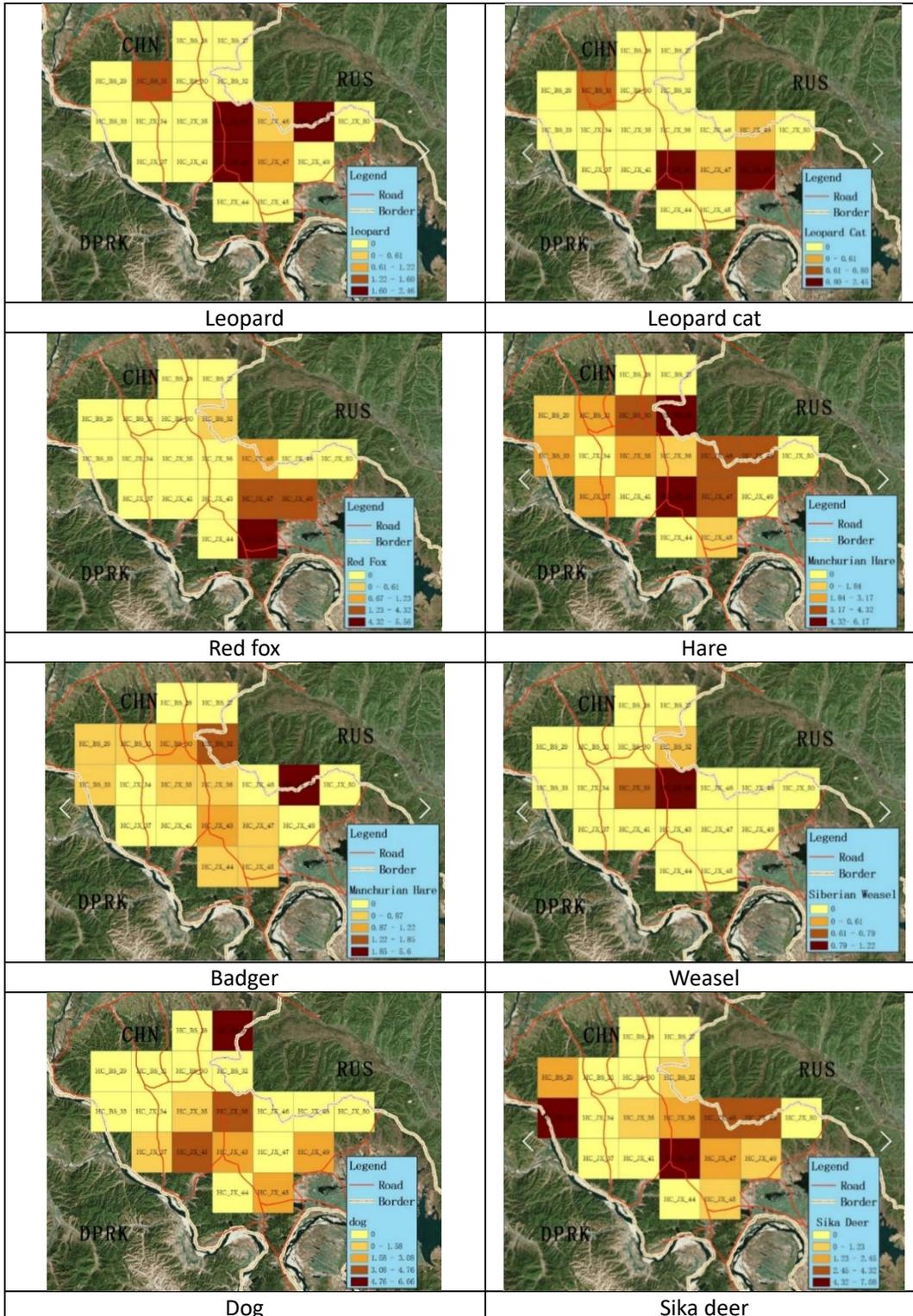


Figure 3-1 spatial Abundance index map (Huangnihe)

Table 3-2 RAI vale of different detections (Jingxin-Banshi)

Detections	RAI ₁ (Day/Detection)	RAI ₂ (Detection/100days)
Human	42.14	2.37
Dog	90.77	1.10
Hare	35.22	2.84
Asian Badger	98.33	1.02
Red fox	90.77	1.10
Raccoon dog	49.17	2.03
Yellow-Throated Marten	2360.00	0.04
Siberian Weasel	590.00	0.17
Leopard cat	236.00	0.42
Sika deer	47.20	2.12
Roe deer	20.70	4.83
Wild boar	20.70	4.83

Leopard	138.82	0.72
Bird	590.00	0.17



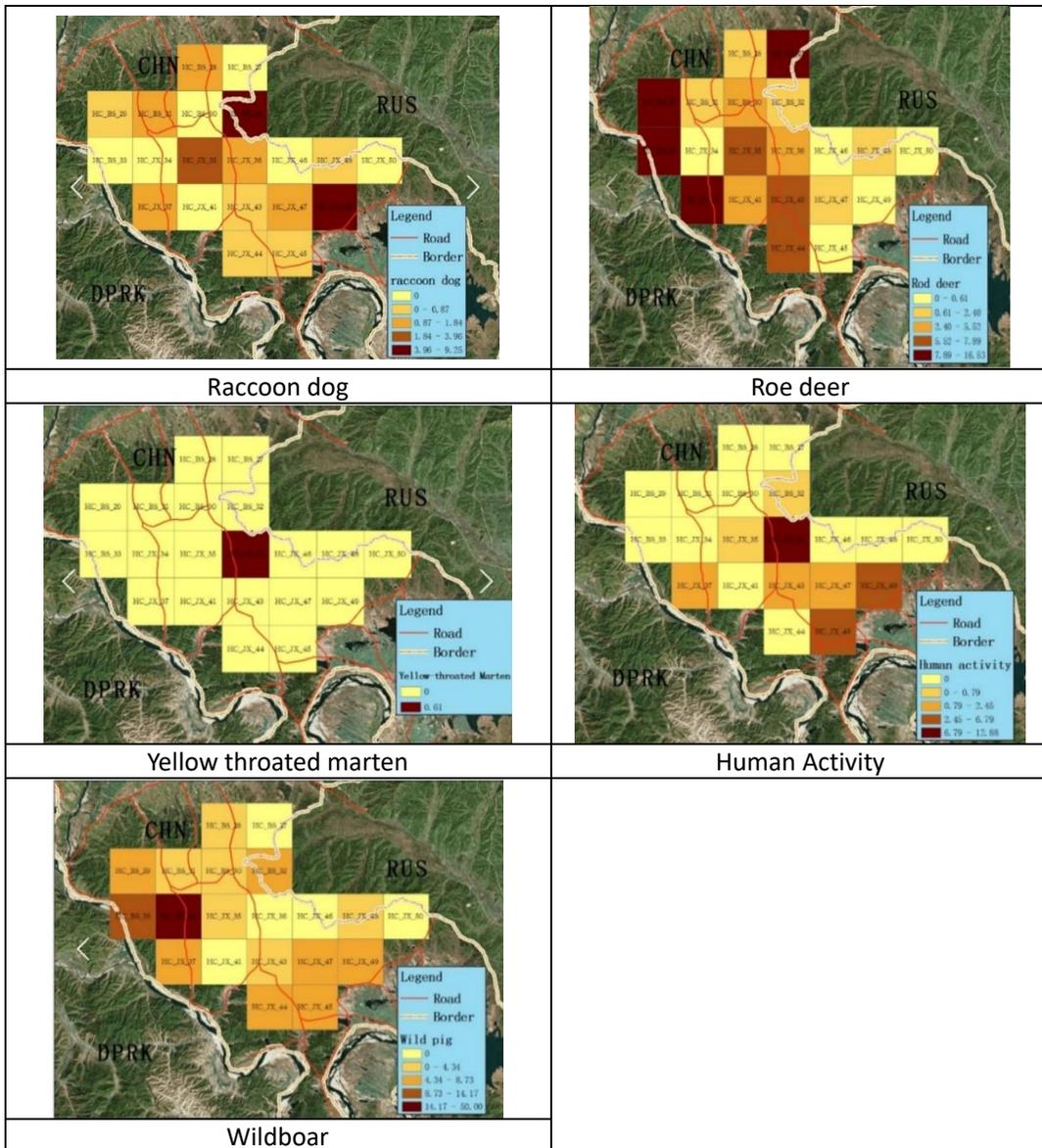


Figure 3-2 spatial Abundance index map (Jingxin-Banshi)

For the basic information about local people's questionnaire survey, their age distribution is mostly 40-50, 50-60, and over 60. Most of samples are Chinese (Han), and majority of them are atheist. Education level is distributed in primary and middle school. Attitude towards wildlife, 46% of samples strongly agree and 37% agree with protecting wild leopard and tiger. Also, 49% agree with wild boar population need to be controlled, 91% think sika deer need to be conserved. 77% will not allow outside people come to hunt, and 39% believe that conserve leopard is a good thing for them.

On the other hand, 36% of samples strongly agree and 35% agree with the statement that they have lived in the corridor area for a long time and they have the right to use resources.

Also, 84% samples think leopard will threaten their livestock, 75% believe leopard eat human, and 50% of samples know how to contact an agency when wildlife issue happens. In summary, local people agree with the idea of conserving wildlife under the condition of them not harming people’s life or damaging people’s livelihood. However, unfortunately, more than half of samples believe leopard will threaten their safety and income from economic activities.

According to the statistical analysis, people’s education level is the most influential factor to determine their attitude toward wildlife. Therefore, sharing wildlife information and new knowledge with local community can be important to raise awareness towards wildlife conservation.

4. Increased awareness of local people towards wildlife

We conducted two workshops in the corridor areas, one in Huangnihe and the other in Hunchun. Around 50 people in total participated in workshops.

In Huangnihe, we shared knowledge about safety issues in forest, recently changed wildlife conservation laws, and drew a map of local resources and people’s yearly working schedule.

In Hunchun with high school students, we focused on sharing basic knowledge on ecology, and played a game of discussing about complex relationship in the forest.

	
<p>Outdoor training</p>	<p>Wildlife ecology education</p>
	
<p>Discussion</p>	<p>Drawing the local community resource distribution map</p>

Listening to the ecosystem service	Introducing ecology of leopard
Students participating the game	Students presenting ideas

Communication & Application of results (max 200 words)

Please explain how the project's results have been communicated and how they have been applied to addressing the project's conservation problem.

Baseline information in corridor areas is barely known by conservation groups. Through our project, information about leopard status, prey distribution, and local community's attitude toward conservation can be acknowledged, and materials can be useful for the corridor area conservation plan. We're planning to provide our findings to our partners and stakeholders with the hope of using the material as a reference for their future works. In addition, we opened an online social media account to share our project progress to larger communities, as more people concern about the corridor conservation issue, more support can be reached to the area in the future.

Monitoring and Evaluation (max 200 words)

What Monitoring and Evaluation activities were carried out to assess the effectiveness of the project's activities?

Throughout the project, we came up with a map of leopard distribution and habitat use, spatial abundance index map, questionnaire survey result and analysis in order to understand leopard status in the targeting corridor area (objective 1), get prey animal density information (objective 2) and investigate habitat quality concerning human activities and influences (objective 3). This baseline information of wildlife and local communities in the corridor area will be provided to local partners and stakeholders for their future work.

For awareness raising activity (objective 4), we received participants' feedback after the education program for evaluation and further improvement. All participants from Huangnihe seemed to enjoy our program, and most of them particularly enjoyed wildlife encounter training as they are closely related to their working environment and useful information.

Hunchun high school students expressed satisfaction through questionnaire survey, yet they provided many comments and requests. Students felt our education course (2 hours) was too short, and more videos and picture would make activities more enjoyable. Most of them were willing to participate again for our next program and hoping to go outside and learn more about wildlife and environment. Therefore, by taking students' requests into account, we will prepare some outdoor activities for our next education program.

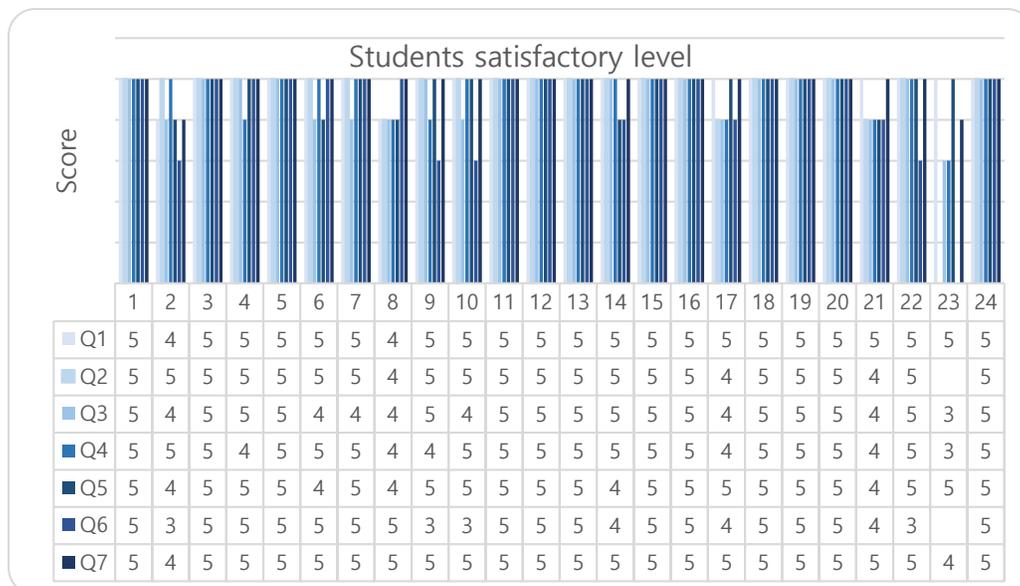


Figure 4-1. Result graph on students' evaluation for satisfactory level

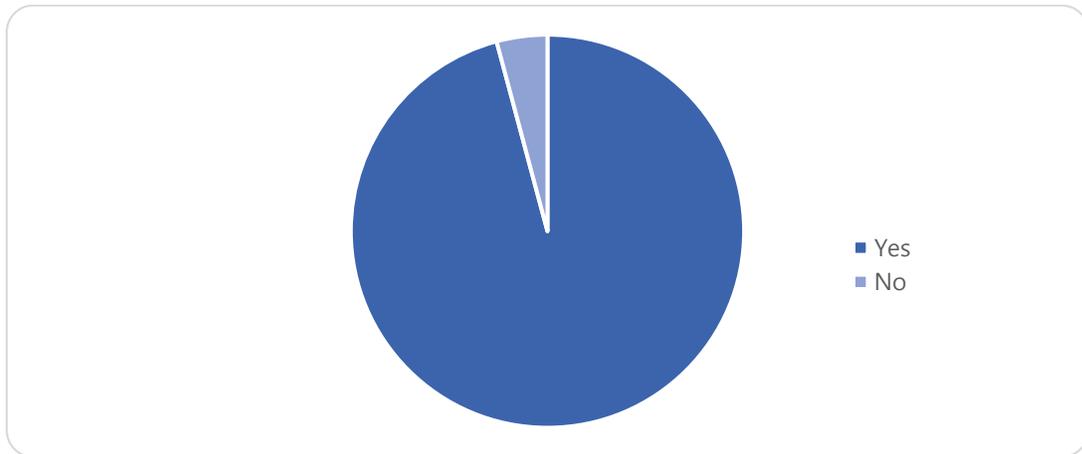


Figure 4-2. Willingness to participate again for the next education program

Achievements and Impacts

Please list the most important Achievements and Impacts of the outputs listed in the previous sections and explain the significance of each one in relation to the overall aim of the project. If possible you should try to come up with a single sentence for each achievement and follow it with a description and explanation of how this achievement contributes to the project's objectives and overall goal

1. We designed the first leopard camera trapping work in Huangnihe which draw substantial attention from the local management groups. The new idea made them more active on helping our work.
2. Camera trapping survey collected important information on leopards and their prey in the corridor area. With collected information, we can get the idea on leopard habitat use, individual number and main prey resources. The distribution of all the wildlife can be used for designing the corridor conservation plan.
3. Snow tracking surveys collected more detail information on prey and leopard activities in winter. Counting the fresh tracks can also help us to know the density of the animals in the area.
4. We did the first household survey in the current leopard habitat in China. During the surveys we were able to make connection with the local people and build a close relationship with them, which helped us to understand more about big cat conservation issues and problems happening in the field.
5. Two workshops were done successfully. We delivered important information and basic knowledge which will be important for participants to change their attitude or behavior in the future.

Capacity Development and Leadership capabilities (Max 250

words)

Please describe how the project contributed to improvements in capacity of the project team members in relation to specific skills and leadership capabilities.

During the process of achieving the project goals, our team member closely worked together and supported each other in solving problems. We learned a great deal about scientific research on big cats and effective communication skills through talking to local community groups. Moreover, through education program, our training skill has improved as well. We learned how to deliver messages or share information in an effective manner considering the audience's needs and expectation. We are more confident in stakeholder engagement and more capable of solving problems with proper solutions in the field. Most importantly, we're more familiar with our study areas, which will be helpful for our future conservation activities in the area.

Section 3:

Conclusion (max 250 word)

Provide accurate, detailed and specific conclusions, avoiding general inferences and interpretations. Describe the overall project's contribution to its central conservation aim and answer questions raised in the introduction, highlight any new information exposed by the project process.

Our research was conducted in two potential corridor areas Huangnihe and Jingxin-Banshi area. We used camera trapping, transect survey and questionnaire survey to get species data to have an overall understanding on the species and their abundance, which is very important for leopard and tiger conservation. We found out that leopards and cubs are using Jingxin-Banshi corridor area, and tiger tracks was found in Huangnihe area. Ungulate abundance index and GIS mapping show the distribution and hot spots. From questionnaire survey, local people have very low education level which influence their attitude towards wildlife. With the purpose of improving local people's awareness, we did two education programs in Huangnihe and Hunchun. Feedback shows that future of wildlife conservation is optimistic as local people are quite open to the idea of changing local situation.

Even though we didn't get camera trapping data on leopard in Huangnihe area, we collected several other forms of data from local forestry department and local people. Considering

limited data and resources, it is difficult to reassure leopard do not use Huangnihe. Yet, we have seen their forest which is a decent habitat for leopard, and the local community is more tolerant to conservation issue. Thus, Huangnihe is still pivotal area for long-term population recovery of amur leopard.

We got photographs of 3 leopard cubs from Jingxin-Banshi area. Other researchers also agreed with the fact that leopard population is increasing, and this new population is dispersing to find more habitat.

Many evidences show that a number of good habitat patches are not effectively connected or used as leopard landscape. Increase in habitat quality and reduce human disturbance are two priorities to realize for letting leopard to disperse to new land and have sustainable growing population in long term.

Problems encountered and lessons learnt (max 500 words)

The purpose of this section is to provide information on lessons learned during the project work that can be usefully applied to other CLP projects. Please answer the below fields:

- *Which project activities and outcomes went well and why?*
- *Which project activities and outcomes have been problematic and in what way, and how has this been overcome?*
- *Briefly assess the specific project methodologies and conservation tools used.*
- *Please state important lessons which have been learnt through the course of the project and provide recommendations for future enhancement or modification to the project activities and outcomes.*

1. Household survey went well. We have experience on doing household survey, and prepared well. Camera trapping in Hunchun runs well, we have experienced consultant group to provide leopard information on the camera setting.

2. The working time for our project has problems. We planned to do the education activity in the winter time, but we realized all of our members should go to the field for surveys, and still not enough labours for the field work, and we needed to delay workshops. However after winter, local people started to get busy, and we hardly could gather them to do the activity. Finally, we got the permission from CLP to delay our work to finish it in summer time.

3. We used camera trapping based on ecological knowledge of Amur leopard. Snow tracking with stratified sampling design. Questionnaire based interview survey and interaction designed workshops. We need to prepare camera traps, battery, mountain facilities, camera, GPS and so on. Indoor activities we used computer, projector and all the relevant software.

4. Since it was the first camera survey in Huangnihe, we did pre-research in September. The area was very low populated, and the signs were very hard to find. We set the cameras based on the leopard ecology information from our experiences, such as mountain ridges. But in the winter time, when we changed camera battery, we found no leopard images were captured. We tried to find more signs of leopard in the snow when during transect survey, yet we did not find any of it. We decided to change some cameras' location in winter, but still no leopard was captured when we removed all cameras. Problems might be limited information on leopards in the area, not enough surveys before setting cameras, and very low population in the area. The lesson we learned is to be more realistic on what are we trying to achieve with a good result.

After our research in corridor area where leopard density is very low density, we would like to recommend the future researchers to use more variety monitoring methods to find more information in that area.

In the future (max 200 words)

Please explain what efforts you will be taking to sustain this work beyond the grant period and what further work would be useful for the conservation of the target species/area.

During our CLP project, our team established a non-government organization in the local with the purpose of continuing the corridor conservation activities. We will keep monitor the wildlife information which is being reported to the local conservation authorities. Also, for alleviating conflict between local people and wildlife, we're planning to launch a pilot activity of developing green economy livelihood in the corridor area.

Since amur leopard is one of big cat animals and need sufficient prey for their sustainable population growth, long-term prey animal monitoring is essential. That way, we can find out problems and influences upon them, and come up with proper solution which will be central for the success of leopard conservation.

Financial Report

Itemized expenses	Total CLP Requested (USD)*	Total CLP Spent (USD)	% Difference	Details & Justification (Justification must be provided if figure in column D is +/- 25%)	Proposed Spending (Preliminary Report Only)
PHASE I - PROJECT PREPARATION					
Communications (telephone/internet/postage)	350.00	135.09	-61%	This was covered by other fundings	
Field guide books, maps, journal articles and other printed materials	400.00	379.36	-5%		
Insurance	300.00		-100%	This was covered by other fundings	
Visas and permits					
Team training	450.00	470.83	5%		
Reconnaissance					
Other (Phase 1)	150.00	119.27	-20%		
EQUIPMENT					
Scientific/field equipment and supplies	5,000.00	5001.29	0%		
Photographic equipment	250.00	300.20	20%		
Camping equipment	400.00	381.10	-5%		
Boat/engine/truck (including car hire)	500.00	620.00	24%		
Other (Equipment)	400.00	391.43	-2%		
PHASE II - IMPLEMENTATION					
Accommodation for team members and local guides	1,800.00	1775.64	-1%		

Food for team members and local guides	900.00	1022.83	14%	Local travel cost more than we expected especially fuel use during the survey. But the over used part was covered by the budget item "communication" and "insurance."
	400.00			
Travel and local transportation (including fuel)		754.37	89%	
Customs and/or port duties				
Workshops	100	120.08	20%	
Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	400.00	350.00	-12%	
Other (Phase 2)				
PHASE III - POST-PROJECT EXPENSES				
Administration	400.00	360.24	-10%	
Report production and results dissemination	300.00	360.24	20%	
Other (Phase 3)				
Total	12,500.00	12,541.97		

Section 4:

Appendices

Please include important additional information not required in the main text along with:

- Completed CLP M&E measures table (see below)
- Raw field data: if large amounts of data were generated, include them here and summarise results using tables and statistics in the main text.
- Copies of any newspaper/magazine articles relating to the project.
- Papers published or manuscripts proposed based on project data

1. CLP M&E measurable table

Output	Number	Additional Information
Number of CLP Partner Staff involved in mentoring the Project	2	WCS China project staff members
Number of species assessments contributed to (E.g. IUCN assessments)	1	Amur leopard to Chinese wildlife survey
Number of site assessments contributed to (E.g. IBA assessments)	2	Huangnihe/Hunchun
Number of NGOs established	1	Sustainable Conservation Network
Amount of extra funding leveraged (\$)	20,000	Cloud funding, Everland foundation, SEE foundation
Number of species discovered/rediscovered	1	Amur leopard
Number of sites designated as important for biodiversity (e.g. IBA/Ramsar designation)	1	Jingxin-banshi in Hunchun is included in Tiger and leopard National Park in 2018
Number of species/sites legally protected for biodiversity	2	
Number of stakeholders actively engaged in species/site conservation management	6	Huangnihe Nature Reserve, Xibeicha forestry station, local community, local school, Hunchun Nature Reserve, WCS China project
Number of species/site management plans/strategies developed	1	Green economy pilot plan
Number of stakeholders reached	2	Local resident, school students and teachers

Examples of stakeholder behaviour change brought about by the project.	2	Through workshop, local residents start to raise local wildlife problems, we explained some important information's such as how to effective react when encounter wildlife in the woods, and the current laws, as well as the importance why we need to protect those species.
Examples of policy change brought about by the project	-	
Number of jobs created	2	SCN
Number of academic papers published	Preparin g	
Number of conferences where project results have been presented	1	SCCS-Beijing 2017

2. Raw field data:

- Transect area

Research Area	Location	Total length (km)	Transect length (km)
Longjing	Tianfuzhi	89.1	11.1
Longjing	Tianfuzhi	136	6.6
Longjing	Tianfuzhi	81.2	18.3
Huangnihe	Duling	106	17.7
Huangnihe	Tuanbei	156	17.3
Huangnihe	Weihuling	34	9.3
Huangnihe	Duling	106	18.2
Huangnihe	Malugou	85.4	8.8
Huangnihe	Tuanbei	210	11
Huangnihe	Tuanbei	131	4.1
Huangnihe	Tuanbei/Xibeicha	58.9	8.5
Huangnihe	Weihuling	25.7	1.5
Huangnihe	Tuanbei	15.3	15.3
Huangnihe	Malugou	129	4.6
Huangnihe	Xibeicha	61.9	2.5
Huangnihe	XiaoBai	1	1
Huangnihe	Malugou/Beidayang		4.7
Huangnihe	Yangmugangzi/dulin		4.2
Huangnihe	Weihuhe	29.5	14.7
Changbaishan	Baihe	10.4	10.4
Changbaishan	Guangming/Dongfangh ongchaxian	24.4	2.3
Changbaishan	Shanheshui	15.5	15.5
Changbaishan	Transect No.4	14.2	6.4
Changbaishan	Qianchuan	84	1.6
Hunchun	Heshan		1.7

- Questionnaire survey sample distribution

Area (town/city name)	No	Survey area (village/forestry unit)
Dunhua-Ermu	1	Huashulinzi
	2	Lianshantun
	3	Xibeicha
	4	Xiadi
Dunhua-Guandi	5	Dahuangzi
	6	Dida
Dunhua-Weiuhu	7	Weiuhu
	8	Dongtuoyaozi
	9	Xituoyaozi
	10	Tuoyaozi5dui (Xiweitang)
	11	Yongan
Antu-Liangbing	12	Nangou
	13	Dongmingcun
	14	Longshan
Antu-Changxing	15	Changping
Antu-Shimen	16	
Yanji-Sandaowan	17	Changxing
	18	Nanzhangzhi
Wangqing-Daxinggou	19	Wuzhan
	20	Hedong
Wangqing-Tianqiaoling	21	Xinhua
	22	Zhangjiadian
Wangqing-Luozigou	24	Xiaobeigou
	25	Xihe
Wangqing-Fuxing	26	Sidao
	27	Huanggou

- tiger and leopard information from interview to the local community

Location	Species	Time	Other info.
Shulan	Leopard	2014	
Weihuhe (huangnihe)	Leopard	2014	
Weihuhe (huangnihe)	Leopard	2015-summer	Heishanding Liaowangta
Sanchang (Huangnihe)	Leopard		
Tuanbei (Huangnihe)	Tiger	2016-12	10.5 cm (pad)
Nanzhangzhi-Yilan (Yanji)-Gucheng	Tiger	2009	Jiang: 15834996797, cattle owner
Lazigou (Huangnihe)	Tiger	2017-4	9.5cm(pad)
Malugou	Tiger	2017-4	
Huapi (Tianqiaoling)	Tiger		
Xinkai (Tianqiaoling)	Tiger	2016-Winter- Camera trap	Male
Xigou (Tianqiaoling)	Tiger	Eat 4 cattle	
Xiaobeigou (Luozigou)	Tiger/ Leopard	2015-Summer	Sheep was eaten
Duhuangzi (Luozigou)	Tiger	2017-2	
Sidao	Tiger	2016-Fall	

- Independent detections from camera trapping and species information (Jingxin-Banshi)

No.	Type	Chinese Name	English Name	Scientific name	Family	IUCN threatened level	Independent Detection	Total Detections
1		豹	Amur Leopard	<i>Panthera pardus orientalis</i>	Felidae	CR	17	
2		豹猫	Leopard Cat	<i>Prionailurus bengalensis</i>	Felidae	LC	10	
3		赤狐	Red Fox	<i>Vulpes Vulpes</i>	Canidae	LC	26	
4		东北兔	Manchurian Hare	<i>Lepus madshuricus</i>	Leporidae	LC	67	
5	Mammal (11)	狗獾	Asian Badger	<i>Meles leucurus</i>	Mustelidae	LC	24	
6		貉	Recoon dog	<i>Nyctereutes procyonoides</i>	Canidae	LC	48	475
7		黄鼬	Siberian Weasel	<i>Mustela sibirica</i>	Mustelidae	LC	4	
8		青鼬	Yellow-Throated Marten	<i>Martes flavigula</i>	Mustelidae	LC	1	
9		狍	Roe Deer	<i>Capreolus pygargus</i>	Cervidae	LC	114	
10		野猪	Wild Boar	<i>Sus scrofa</i>	Suidae	LC	114	
11		梅花鹿	Sika deer	<i>Cervus nippon</i>	Cervidae		50	
12	Bird (2)	鸟类	Aves				2	2
13		猎人	Hunting				8	
14		捕鱼或蛤蟆	Fishing/frog collecting				6	
15	People (6)	登山者	Climber				4	29
16		研究人员	Researcher				1	
17		林业工人	Forestry Worker				1	
18		其他人	Other people				9	
19	Livestock (1)	狗	Dog				26	26
20	People by transport (3)	摩托车	Motorcycle				1	16
21		汽车	Car				11	
22		拖拉机	Tractor				4	

- Correlations Analysis on the independent detection frequency in Jingxin-Banshi

		Human	Dog	Hare	Badger	Red Fox	Leopard Cat	Sika Deer	Roe Deer	Wild Boar	Leopard	Total Detections
Human	Pearson Correlation	1	<u>.872**</u>	-.099	-.084	.239	.160	.123	.042	-.048	.407	.166
	Sig. (2-tailed)		.000	.677	.724	.309	.501	.607	.861	.842	.075	.483
Dog	Pearson Correlation	<u>.872**</u>	1	-.031	-.115	.353	.345	.206	.100	-.015	.370	.238
	Sig. (2-tailed)	.000		.896	.628	.127	.136	.384	.675	.948	.108	.312
Hare	Pearson Correlation	-.099	-.031	1	<u>.530*</u>	-.017	.266	<u>.570**</u>	.126	.133	<u>.465*</u>	<u>.621**</u>
	Sig. (2-tailed)	.677	.896		.016	.942	.257	.009	.596	.575	.039	.003
Badger	Pearson Correlation	-.084	-.115	<u>.530*</u>	1	-.113	.166	.417	-.051	.046	<u>.551*</u>	.382
	Sig. (2-tailed)	.724	.628	.016		.634	.484	.067	.830	.848	.012	.097
Red Fox	Pearson Correlation	.239	.353	-.017	-.113	1	.255	.011	-.359	.418	-.076	.229
	Sig. (2-tailed)	.309	.127	.942	.634		.278	.962	.120	.067	.749	.332
Leopard Cat	Pearson Correlation	.160	.345	.266	.166	.255	1	<u>.505*</u>	-.022	.201	<u>.495*</u>	<u>.452*</u>
	Sig. (2-tailed)	.501	.136	.257	.484	.278		.023	.927	.395	.026	.046
Sika Deer	Pearson Correlation	.123	.206	<u>.570**</u>	.417	.011	<u>.505*</u>	1	.299	.282	<u>.610**</u>	<u>.661**</u>
	Sig. (2-tailed)	.607	.384	.009	.067	.962	.023		.200	.228	.004	.002
Roe deer	Pearson Correlation	.042	.100	.126	-.051	-.359	-.022	.299	1	<u>.471*</u>	.006	<u>.553*</u>
	Sig. (2-tailed)	.861	.675	.596	.830	.120	.927	.200		.036	.980	.011
Wild Boar	Pearson Correlation	-.048	-.015	.133	.046	.418	.201	.282	<u>.471*</u>	1	-.235	<u>.757**</u>
	Sig. (2-tailed)	.842	.948	.575	.848	.067	.395	.228	.036		.319	.000
Leopard	Pearson Correlation	.407	.370	<u>.465*</u>	<u>.551*</u>	-.076	<u>.495*</u>	.610**	.006	-.235	1	.312
	Sig. (2-tailed)	.075	.108	.039	.012	.749	.026	.004	.980	.319		.180
Total Detecting	Pearson Correlation	.166	.238	<u>.621**</u>	.382	.229	<u>.452*</u>	<u>.661**</u>	<u>.553*</u>	<u>.757**</u>	.312	1
	Sig. (2-tailed)	.483	.312	.003	.097	.332	.046	.002	.011	.000	.180	

N=20, **. Correlation is significant at the 0.01 level (2-tailed).*. Correlation is significant at the 0.05 level (2-tailed).

- Factors analysis between wildlife and human (Tiger-gender)

		gender			Total
			man	woman	
Tiger	Count	1	3	1	5
	% within Tiger	20.0%	60.0%	20.0%	100.0%
	% within gender	50.0%	7.1%	1.8%	5.0%
	% of Total	1.0%	3.0%	1.0%	5.0%
dislike	Count	0	6	13	19
	% within Tiger	.0%	31.6%	68.4%	100.0%
	% within gender	.0%	14.3%	23.2%	19.0%
	% of Total	.0%	6.0%	13.0%	19.0%
like	Count	0	13	11	24
	% within Tiger	.0%	54.2%	45.8%	100.0%
	% within gender	.0%	31.0%	19.6%	24.0%
	% of Total	.0%	13.0%	11.0%	24.0%
like them very much	Count	0	3	3	6
	% within Tiger	.0%	50.0%	50.0%	100.0%
	% within gender	.0%	7.1%	5.4%	6.0%
	% of Total	.0%	3.0%	3.0%	6.0%
no feeling	Count	0	10	24	34
	% within Tiger	.0%	29.4%	70.6%	100.0%
	% within gender	.0%	23.8%	42.9%	34.0%
	% of Total	.0%	10.0%	24.0%	34.0%
very hate	Count	1	7	4	12
	% within Tiger	8.3%	58.3%	33.3%	100.0%
	% within gender	50.0%	16.7%	7.1%	12.0%
	% of Total	1.0%	7.0%	4.0%	12.0%
Total	Count	2	42	56	100
	% within Tiger	2.0%	42.0%	56.0%	100.0%
	% within gender	100.0%	100.0%	100.0%	100.0%
	% of Total	2.0%	42.0%	56.0%	100.0%

- Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.581 ^a	10	.024
Likelihood Ratio	16.335	10	.090
N of Valid Cases	100		

a. 10 cells (55.6%) have expected count less than 5. The minimum expected count is .10.

There are reference between tiger preference and gender difference (Sig=0.024)

- Factors analysis between wildlife and human (Tiger-Education)

		Education		
		High school	higher than high school	middle school
Tiger	Count	2	1	1
	% within Tiger	40.0%	20.0%	20.0%
	% within Education	66.7%	6.3%	2.1%
	% of Total	2.0%	1.0%	1.0%
dislike	Count	0	5	7
	% within Tiger	.0%	26.3%	36.8%
	% within Education	.0%	31.3%	14.9%
	% of Total	.0%	5.0%	7.0%
like	Count	1	3	10
	% within Tiger	4.2%	12.5%	41.7%
	% within Education	33.3%	18.8%	21.3%
	% of Total	1.0%	3.0%	10.0%
like them very much	Count	0	2	3
	% within Tiger	.0%	33.3%	50.0%
	% within Education	.0%	12.5%	6.4%
	% of Total	.0%	2.0%	3.0%
no feeling	Count	0	5	15
	% within Tiger	.0%	14.7%	44.1%
	% within Education	.0%	31.3%	31.9%
	% of Total	.0%	5.0%	15.0%
very hate	Count	0	0	11
	% within Tiger	.0%	.0%	91.7%
	% within Education	.0%	.0%	23.4%
	% of Total	.0%	.0%	11.0%
Total	Count	3	16	47
	% within Tiger	3.0%	16.0%	47.0%
	% within Education	100.0%	100.0%	100.0%
	% of Total	3.0%	16.0%	47.0%

- Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40.257 ^a	15	.000
Likelihood Ratio	27.947	15	.022
N of Valid Cases	100		

- Income level and tiger preference

		Income			
			100000RMB	15000RMB	35000RMB
Tiger	Count	3	1	0	1
	% within Tiger	60.0%	20.0%	.0%	20.0%
	% within Income	75.0%	5.9%	.0%	2.7%
	% of Total	3.0%	1.0%	.0%	1.0%
dislike	Count	0	2	3	8
	% within Tiger	.0%	10.5%	15.8%	42.1%
	% within Income	.0%	11.8%	17.6%	21.6%
	% of Total	.0%	2.0%	3.0%	8.0%
like	Count	0	2	6	6
	% within Tiger	.0%	8.3%	25.0%	25.0%
	% within Income	.0%	11.8%	35.3%	16.2%
	% of Total	.0%	2.0%	6.0%	6.0%
like them very much	Count	0	2	0	2
	% within Tiger	.0%	33.3%	.0%	33.3%
	% within Income	.0%	11.8%	.0%	5.4%
	% of Total	.0%	2.0%	.0%	2.0%
no feeling	Count	1	5	8	17
	% within Tiger	2.9%	14.7%	23.5%	50.0%
	% within Income	25.0%	29.4%	47.1%	45.9%
	% of Total	1.0%	5.0%	8.0%	17.0%
very hate	Count	0	5	0	3
	% within Tiger	.0%	41.7%	.0%	25.0%
	% within Income	.0%	29.4%	.0%	8.1%
	% of Total	.0%	5.0%	.0%	3.0%
Total	Count	4	17	17	37

	% within Tiger	4.0%	17.0%	17.0%	37.0%
	% within Income	100.0%	100.0%	100.0%	100.0%
	% of Total	4.0%	17.0%	17.0%	37.0%

		Income		Total
		5000RMB	80000RMB	
Tiger	Count	0	0	5
	% within Tiger	.0%	.0%	100.0%
	% within Income	.0%	.0%	5.0%
	% of Total	.0%	.0%	5.0%
dislike	Count	1	5	19
	% within Tiger	5.3%	26.3%	100.0%
	% within Income	16.7%	26.3%	19.0%
	% of Total	1.0%	5.0%	19.0%
like	Count	4	6	24
	% within Tiger	16.7%	25.0%	100.0%
	% within Income	66.7%	31.6%	24.0%
	% of Total	4.0%	6.0%	24.0%
like them very much	Count	0	2	6
	% within Tiger	.0%	33.3%	100.0%
	% within Income	.0%	10.5%	6.0%
	% of Total	.0%	2.0%	6.0%
no feeling	Count	1	2	34
	% within Tiger	2.9%	5.9%	100.0%
	% within Income	16.7%	10.5%	34.0%
	% of Total	1.0%	2.0%	34.0%
very hate	Count	0	4	12
	% within Tiger	.0%	33.3%	100.0%
	% within Income	.0%	21.1%	12.0%
	% of Total	.0%	4.0%	12.0%
Total	Count	6	19	100
	% within Tiger	6.0%	19.0%	100.0%
	% within Income	100.0%	100.0%	100.0%
	% of Total	6.0%	19.0%	100.0%

- Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	71.259 ^a	25	.000
Likelihood Ratio	49.476	25	.002
N of Valid Cases	100		

a. 30 cells (83.3%) have expected count less than 5. The minimum expected count is .20.

- Symmetric Measures^a

	Value
N of Valid Cases	100

a. Correlation statistics are available for numeric data only.

We found tiger preference have correlation with income level, but not as we thought before they have no significant correlation with activities.

- Tiger-Activities

		Activity			
			farming	forestry economy	grazing
Tiger	Count	1	3	0	0
	% within Tiger	20.0%	60.0%	.0%	.0%
	% within Activity	100.0%	4.5%	.0%	.0%
	% of Total	1.0%	3.0%	.0%	.0%
dislike	Count	0	18	1	0
	% within Tiger	.0%	94.7%	5.3%	.0%
	% within Activity	.0%	26.9%	10.0%	.0%
	% of Total	.0%	18.0%	1.0%	.0%
like	Count	0	15	2	2
	% within Tiger	.0%	62.5%	8.3%	8.3%
	% within Activity	.0%	22.4%	20.0%	33.3%
	% of Total	.0%	15.0%	2.0%	2.0%
like them very much	Count	0	3	1	0
	% within Tiger	.0%	50.0%	16.7%	.0%
	% within Activity	.0%	4.5%	10.0%	.0%
	% of Total	.0%	3.0%	1.0%	.0%
no feeling	Count	0	21	4	3
	% within Tiger	.0%	61.8%	11.8%	8.8%
	% within Activity	.0%	31.3%	40.0%	50.0%
	% of Total	.0%	31.3%	40.0%	50.0%

	% of Total	.0%	21.0%	4.0%	3.0%
very hate	Count	0	7	2	1
	% within Tiger	.0%	58.3%	16.7%	8.3%
	% within Activity	.0%	10.4%	20.0%	16.7%
	% of Total	.0%	7.0%	2.0%	1.0%
Total	Count	1	67	10	6
	% within Tiger	1.0%	67.0%	10.0%	6.0%
	% within Activity	100.0%	100.0%	100.0%	100.0%
	% of Total	1.0%	67.0%	10.0%	6.0%

AGE	Value	df	Asymp. Sig. (2-sided)	GENDER	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	35.995 ^a	30	.208	Pearson Chi-Square	20.581 ^a	10	.024
Likelihood Ratio	34.910	30	.246	Likelihood Ratio	16.335	10	.090
N of Valid Cases	100			N of Valid Cases	100		

Education	Value	df	Asymp. Sig. (2-sided)	Income	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40.257 ^a	15	.000	Pearson Chi-Square	71.259 ^a	25	.000
Likelihood Ratio	27.947	15	.022	Likelihood Ratio	49.476	25	.002
N of Valid Cases	100			N of Valid Cases	100		

Activity	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	36.477 ^a	30	.193
Likelihood Ratio	26.906	30	.628
N of Valid Cases	100		

3. Copies of any newspaper/magazine articles relating to the project.

Content	Title in local language	link
From tiger to leopard CLP supported project interview to Ying LI 's team and their work	CLP 校友李颖专访 从东北虎到远东豹 理想与现实的碰撞让她不断探寻人生的意义 (Chinese)	http://mp.weixin.qq.com/s?_biz=MzAxMjc5MDMzNg%3D%3D&idx=1&mid=2649130029&sn=4d0492161b8261f6906edd a00c74fadc
Corridor searching for tiger	<u>두만강 생태통로 프로젝트 -</u> <u>두만강 호랑이 루트를</u> <u>찾아서</u> (Korean)	http://savetiger.kr/21076386329

4. Papers published or manuscripts proposed based on project data

We're in the process of further analysing data we collected and drafting a paper. Although our original plan was to analyse 100 households for the questionnaire survey, we decided to conduct 200 households survey for the better result. Thus, after full analysis of 200 households survey, we'll publish a paper.

Bibliography

List all the sources that you used, highlighting the most important ones. Also include the publications and communication outputs from the project as well as papers being prepared for publication by project members.

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P.A. Stephens, O.Yu. Zaumyslova, D.G. Miquelle, A. I. Myslenkov and G.D. Hayward, Estimating population density from indirect sign: track counts and the Formozov-Malyshev-Pereleshin formula, Animal Conservation 9(2006) 339-348

Changzhi Zhang Amur tiger and prey monitoring and conflicts. Phd thesis. 2013

Address list and web links

An annotated list of useful names, addresses and websites

WeChat account: gh_c2b47de79380

Distribution list

List where copies of the report have been distributed for reference by future project leaders and others, and where the report can be bought (if relevant).

*Huangnihe Nature Reserve

*WCS tiger project

Ongoing: it will be as reference for China Tiger Leopard National Park