



Amur tiger conservation in China
FINAL REPORT to
21st Century Tiger

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Introduction

This report describes the conservation activities implemented by WCS China in co-operation with the Hunchun Reserve, Jilin Province, China. The contents of the report are:

1. Equipment purchased
2. Social Research
3. Education and awareness
4. Compensation for livestock kills
5. Conservation network
6. Population monitoring
7. Discussion

Tigris Foundation assisted in project design, the development of a proposal to 21st Century Tiger, evaluation and reporting.

The paragraph on livestock kills is based to a large extent on an unpublished paper by the Chinese biology student Liu Yu who made a study of the subject with assistance and financial support from WCS. We also used information from an unpublished paper by Liu Yu on tiger monitoring and a paper by Wu Yue on ungulate monitoring. We would like to thank Liu Yu and Wu Yue for allowing us to use information from their papers.

The photographs in the report were made by WCS and the Hunchun reserve staff.

The report includes information on related activities by WCS China that were not financed by 21st Century Tiger.

We would like to thank **21st Century Tiger** for their generous support for the tiger conservation work of WCS China in Hunchun.

1. Equipment purchased

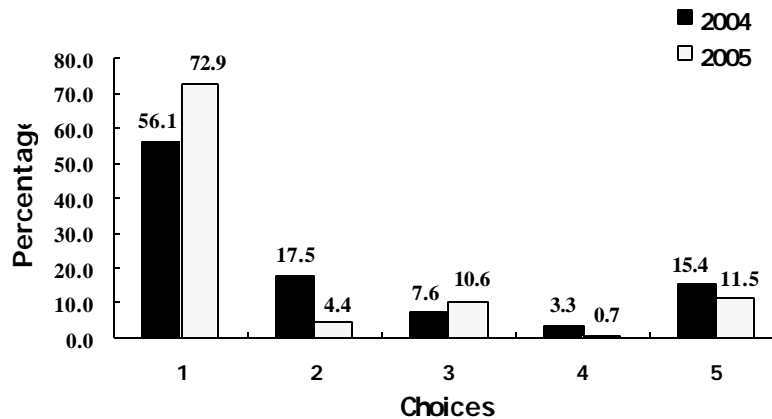
The following purchases have been made (as described in the project proposal):

- A digital camera. Photos made with this camera are available to 21st Century Tiger.
- A multi-media projector which is now used by the reserve for education purposes and during meetings, such as the official launch of the compensation project.
- 20 costumes were purchased that are used for educational performances in villages.

2. Social Research.

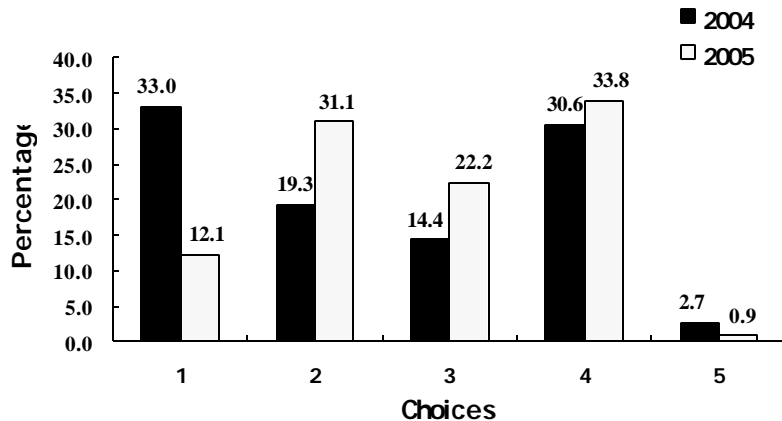
In spring 2004 WCS China had a first social survey conducted in villages inside and near the Hunchun reserve. The survey measured attitudes, opinions and behaviour concerning conservation issues and the reserve. The survey was repeated in spring 2005 in order to measure progress. The survey was designed and carried out with the assistance of university staff and students. The second survey recorded very significant improvements in the attitudes and opinions. A few figures illustrating the striking positive changes are provided here.

1. Considering that conservation of wild tigers and leopards costs a lot of manpower and money, do you think it's necessary to protect these animals?



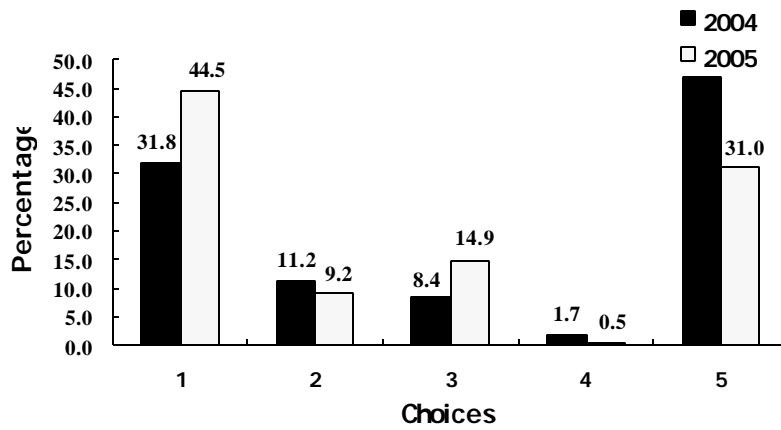
1=completely agree; 2=relatively agree; 3=not sure; 4=relatively disagree; 5=completely disagree

2. What do you think the presence of the reserve will bring villagers in the future?



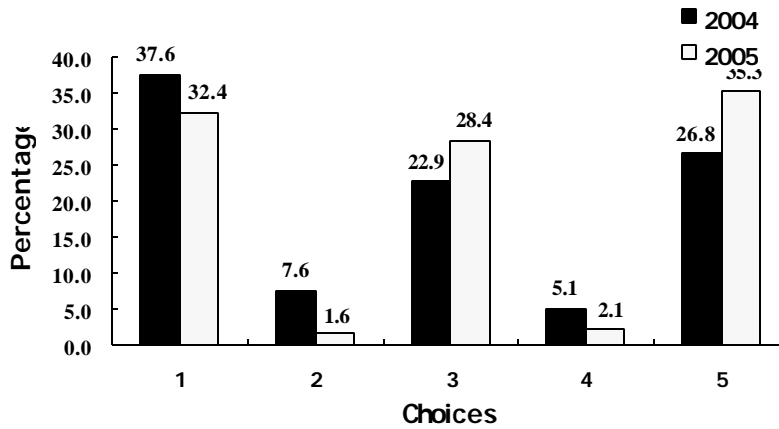
1=nothing but disadvantages; 2=more disadv.; 3= not sure; 4=more advantages; 5= nothing but advant.

3. Are you proud to live in a reserve with wild tigers and leopards?



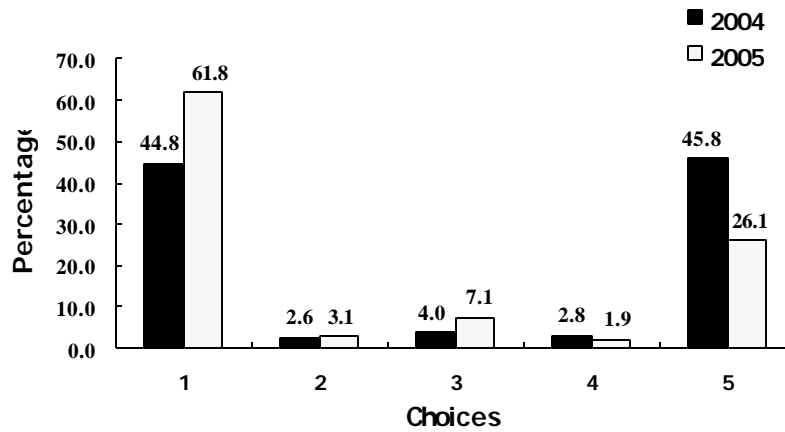
1=very proud; 2=relatively proud; 3=not sure; 4=relatively not proud; 5= not proud at all

4. Would you agree to have the reserve abolished?



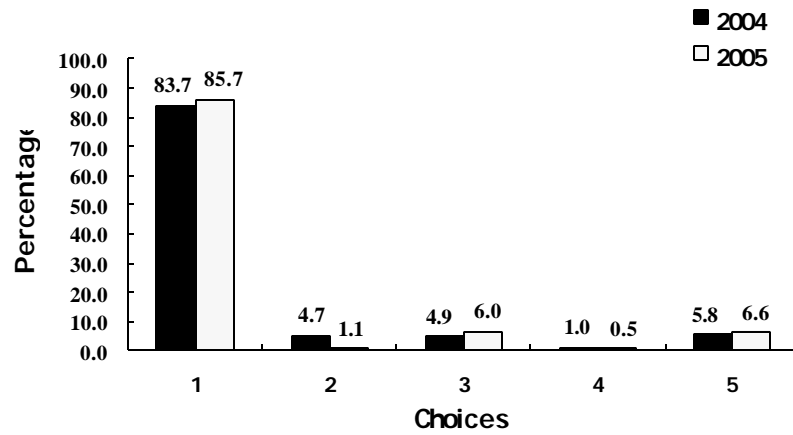
1=completely agree; 2=relatively agree; 3=not sure; 4=relatively disagree; 5=completely disagree

5. If you find pugmarks of tigers or leopards, would you report it to the reserve?



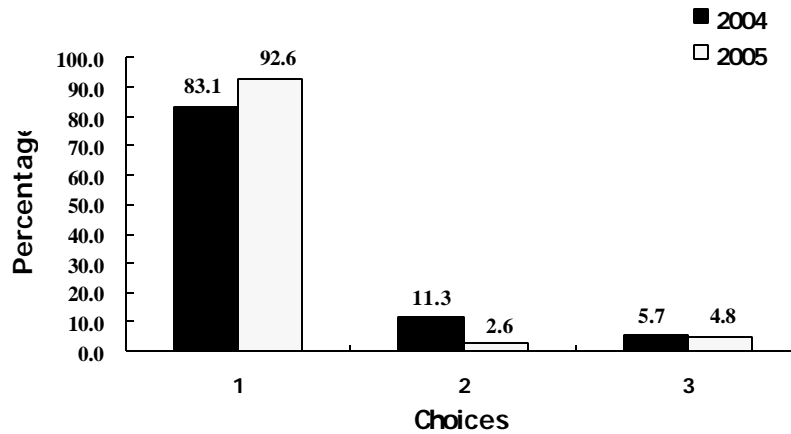
1= I will; 2= I will in most cases; 3= I am not sure; 4= in most cases I won't 5= I won't

6. Will you remove snares if you find them in forests?



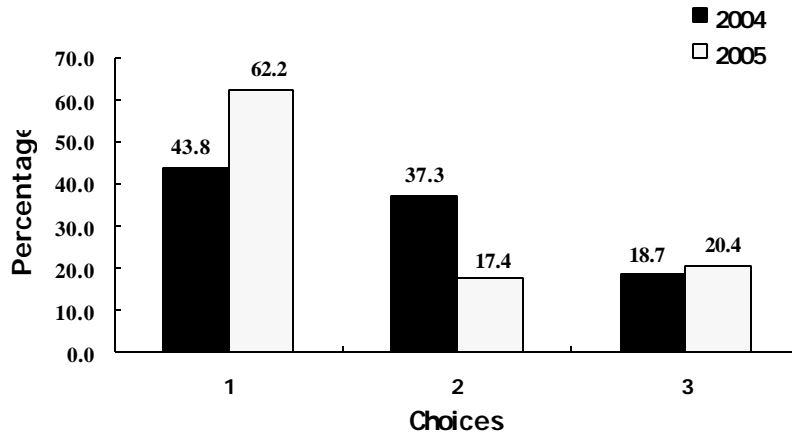
1= I will; 2= I will in most cases; 3= I am not sure; 4= in most cases I won't 5= I won't

7. As far as you know, are there any poachers in your village?



0=no; 1=yes; 2=not sure

8. Are there many local villagers going across the border to collect NTFPs in Russia?



1=no; 2=yes; 3=not sure

Hunchun Reserve in Jilin Province, China

- Core area
- Border area
- Experimental area
- Nature reserve in Russia
- Wildlife refuge in Russia
- Conservation project(s) village

- (E) Education projects in this village
- (C) Compensations were paid in village
- (N) Village part of conservation network



Discussion of the social survey results

The establishment of the reserve caused a number of actual and potential negative effects on the livelihood of local villagers. We believe that this led to the initial, negative attitude towards the reserve and (tiger) conservation that was found during the first survey.

We will briefly describe the (potential) negative impacts on the rural livelihood in villages in and around the reserve. The villagers are allowed to enter any part of the Hunchun Nature Reserve, including the core zone. No villages were relocated when the reserve was established and a number of settlements are located in the experimental and buffer zones of the reserve. There is a total ban on hunting in this part of

China, and as a result the reserve did not negatively impact any legal hunting. In spite of this the establishment of the reserve did impact the livelihood of villagers. Firstly, the use of timber and non-timber-forest-products (NTFPs) was limited and secondly, livestock grazing was restricted. There is a total ban on grazing and harvest of timber and NTFPs in the core zone of the reserve. In the buffer and experimental zone restrictions are in place. For instance, only the harvest and collection of timber with a diameter of 10 cm or less is allowed in the buffer zone. Thirdly, the villagers expect that the reserve will lead to an increase in tiger and ungulate numbers and subsequently to an increase of the damage caused by these animals (as tigers in Hunchun are notorious livestock killers and ungulates -most of all wild boar- cause serious damage to crops).

In light of the above, it is not surprising that most villagers initially regarded the establishment of the reserve as a negative development. In the 2004 survey 47% of the participants stated to be *not at all proud* of living in a reserve with tigers and leopards. Seventy-five percent fully agree with a statement that the reserve was established without considering the interests of local people, and 45% (strongly) agreed with a suggestion to abolish the reserve while only 32% (strongly) disagreed.

WCS China has started a number of conservation activities in and around the Hunchun reserve. We hope the projects will improve the attitudes, opinions and behaviour of local villagers concerning the reserve and (tiger) conservation. The projects that may help to bring about such improvements are:

1. compensation of livestock kills by tigers in and around the reserve
2. education and awareness activities
3. a conservation network that offers an opportunity for villagers to actively participate in conservation
4. the social survey itself (because paying attentions to opinions usually already has a positive effect)

It is difficult to determine to what extent our projects caused the surprisingly positive improvements that we measured during the second social survey in 2005. Probably the survey participants have become more aware that the survey is part of the conservation efforts, which may have led to somewhat more positive answers because the participants want to please the people that do the interviews during the survey. However, there is no doubt that the opinions have indeed substantially improved and that our projects played a major role in achieving this.

Besides the education projects, a major contribution to the improvements was also made by the compensation project. When the first survey was conducted in the spring of 2004, villagers were not compensated for livestock kills at all (as was the case before the establishment of the reserve). Livestock kills by tigers occur relatively frequent and cause considerable losses. A family often owns no more than 3 to 4 large animals (cows or mules) so each livestock kill causes a very considerable loss in the family income and is in fact a small tragedy. The compensation payments that were started in June 2004 therefore brought about a considerable improvement for the villagers. The reported livestock kills that were documented between May 2002 (when the reserve first started to record them) and June 2004 were also compensated. The compensation payments are made by the reserve (with funds provided by 21st CT to WCS China). As a result the villagers associate the payments with the reserve. The fact that the reserve pays the compensations is emphasised in the education projects and this helps to improve the image of the reserve. The percentage of survey participants that believed that the reserve will bring nothing but disadvantages has dropped from 33% in 2004 to 12% in 2005. Although the compensation is less than the value of the livestock (40%-50%) we believe that the compensation payments are a major factor contributing to the very positive changes.

An unanswered question is if the positive changes in attitude and opinions have already led to positive changes in behaviour as well. The survey results suggest that behaviour has changed positively (e.g. more villagers state that they will report tracks of leopards and tigers and will remove snares that they find in the forests. Also, fewer participants think that many villagers cross the border to poach in Russia). However, it is unclear if these results reflect real changes in behaviour. For instance, it is difficult to determine if poaching by Chinese villagers in Russia has indeed declined and if snares are indeed more often removed. WCS and the reserve will monitor if the number of reported leopard and tiger tracks. An increase in reported tracks would be an indication of positive behavioural change.

3. Education and awareness

The following activities were organised with funds provided by 21st CT:

1. Eight issues (2000 copies per issue) of a black and white conservation newsletter were distributed in villages in and around the reserve. The newsletters are written, designed and printed by the reserve. WCS assisted only in the development of the first issue.



2. WCS and the reserve organised a training workshop for village leaders in October 2004 and August 2005 in the office of the reserve. More than 50 leaders from various villages attended the workshops. During the workshop information about tigers, leopards and their conservation was provided to the village elders, who also discussed possible methods of diminishing wildlife-human conflicts with WCS and the reserve staff.



3. A training workshop for local teachers has been organised in August 2005. Two teachers from Hunchun attended a WCS teachers' training workshop in Shanghai from 4 to 8 December 2004; these two teachers assisted in organising the local workshop and will assist in future conservation education activities in schools in Hunchun.

WCS organised a number of additional education activities (not included in the project proposal) with the funds provided by 21st CT:

1. A "Model School" conservation education program has been established. The programme is financed jointly by WCS, the Hunchun Nature Reserve and the education department of the Jilin forest bureau. Schools that join the programme sign an agreement in which they promise to improve conservation awareness among the pupils of the school. The schools organise conservation events and integrate conservation education into their daily lessons. WCS provides support in the form of information on conservation topics, education materials and teacher's instructions and suggestions. WCS organises meetings, in the Hunchun reserve office, with teachers from schools that participate in the programme. During the meeting the conservation education activities of teachers, the assistance



they require, and their plans for the future are discussed. Teachers who did very good work have received a reward (about 20-40 dollars). Eight schools within the reserve have joined so far and 10 more outside the reserve boundaries. Ten more schools have joined in areas with suitable tiger and leopard habitat in the neighbouring Heilongjiang province (located north of the reserve).

2. WCS China translated the WCS education manual "Teachers for Tigers" into Chinese. Certain changes were made in the handbook to make it more suitable for a Chinese cultural context: a few education methods were removed or revised, and information on the important role of tigers in Chinese culture, and Chinese myths and legends about tigers, was included. WCS China presently uses the manual during teacher's workshops.

WCS China also implemented other education activities with funds provided by other sources:

1. A conservation performance team was set up in Hunchun Reserve in August 2003 with members coming from Hunchun Nature Reserve Conservation and Management Bureau. Later a number of local villagers that do not work for the bureau joined the team. The team members received training over several months. They perform in the major villages and towns, and wherever they go they receive a warm welcome from local residents. The performances include singing, dancing and comic opera. The team has handed out 300 T-shirts and over 2000 copies of booklets about the reserve and conservation to people who successfully answer questions asked during the performance. During 2004 and 2005 the team performed not only in villages, but also for border troops in Hunchun.
2. Staff from the reserve's Education Centre visit villages in the reserve to give presentations about tiger conservation and discuss issues concerning the reserve and conservation. A laptop computer connected to the multi-media projector is used for these presentations. The presentations provide a good opportunity for the reserve staff to talk face-to-face with the local villagers. Due to space limitations no more than 30 people can participate in each of these activities. However, the presentations are effective in improving communications and increasing the conservation awareness of local people. To date, the reserve staff have



visited more than 10 villages (mostly villages near the core area or villages in areas frequently visited by tigers).

3. An essay contest for school children was organised between April and July in 2004 and during the same period in 2005. For each contest approximately 350 essays were selected from all primary and secondary schools in Hunchun. After each of the two contests, 20 children received a first prize, 40 a second prize, and 40 an encouragement prize. The first award ceremony was organised on July 5 2004, in the Hunchun reserve office, and the second at the closing ceremony of the teachers training workshop on 23 August 2005. Twenty teachers /schools received a reward for their involvement in the organisation of the contest. The prizes were mainly books, and the average value of the prizes was about US\$ 6.

4. Compensation of livestock kills

On 27 June 2004 a ceremony was held in Chunhua town in Hunchun Nature Reserve to launch the compensation programme. Government officials from Hunchun and Yanbian autonomous state in Northeast Jilin attended and made speeches during the ceremony. In the past, before the reserve was established, livestock kills were not compensated, and so the compensation payments by the reserve have helped to increase its popularity among local villagers. Compensation has been paid not only for the

livestock kills that took place after the start of the programme, but also for all kills that took place since the reserve started documenting livestock kills in May 2002. Some of the villagers that suffered livestock kills are very happy with the compensation they received, especially those who lost livestock a long time ago. Many of them had lost hope of receiving anything. However, not all the people are satisfied with the level of the compensation payments: in general the reserve compensates 40%-50% of the estimated value of the livestock killed. Initially we aimed to compensate 70% of the costs of attacks on livestock, but the reserve favoured lower compensations. The reserve thinks that it is unlikely that Chinese authorities will finance compensations at a higher level than 40% in the future. A significant drop in the level of compensations (when authorities take over the financial burden from 21st CT and WCS) would lead to dissatisfied villagers and that is the opposite of what we want to achieve. We will therefore urge the authorities not to lower the level of compensation.



Tiger eating a cow, Jan 2004. Reserve staff made the photo with a camera-trap provided by WCS.

Our initiative to start a compensation programme attracted attention from the public and led to discussions about livestock kills within the provincial government. We have made clear from the start that our financial support for compensation payments is only temporary. Jilin government has announced that it will implement a government compensation payment programme. However, unfortunately the programme is not yet effective. WCS China has decided to continue compensation payments, because discontinuation of the payments would have a serious negative effect on the opinions of the local villages concerning the reserve and tiger conservation.

WCS has found additional funds to continue payments for the time being.

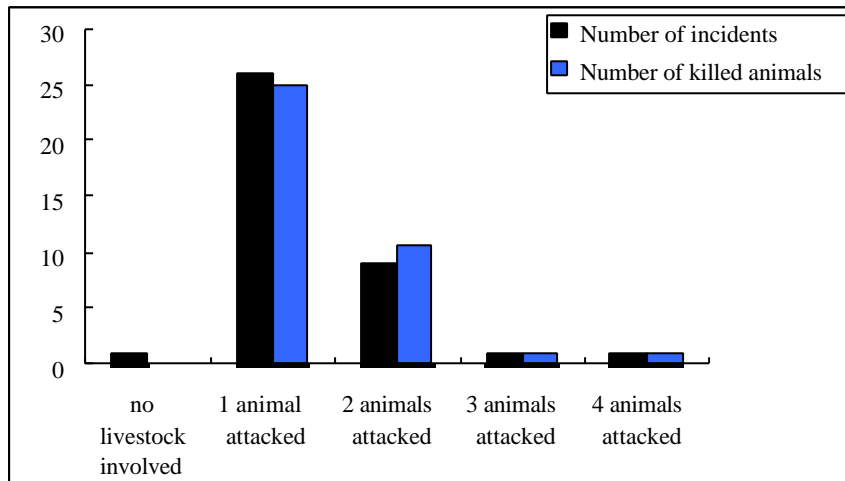
The table below provides an overview of livestock kills and compensation data.

Livestock kills by tigers compensated in and around the Hunchun Nature Reserve						
Period	cows	Horses mules	Total animals	Number of incidents	Value \$US	Compensation 1)
15 July - 31 Dec 2002	12	2	14	9	\$3,120	\$1,330
1 January – 31 Dec 2003	15	4	22 2)	18	\$3,327	\$1,300
1 January – 31 Dec 2004	26	7	33	32	\$7,003	\$2,850
1 January – 30 July 2005	10	0	10	5	\$2,600	\$1,300
Total	63	13	79	64	\$16,050	\$6,780

1) compensation by reserve with funds from 21st CT

2) 2003: 15 cows, 4 horses, 2 dogs, 1 sheep

Students travelled with reserve staff to sites where attacks on livestock took place from May 2002 to October 2004 and documented 38 livestock attacks on livestock during this period. A total of 51 animals were killed or injured: 40 cattle, 8 horses and 3 dogs. Claims where a single livestock animal died form the majority. The number of livestock involved in the attacks varied from 0 to 4 (0 refers to 1 incident where a tiger unsuccessfully tried to enter a pen with pigs. No pigs were injured or killed in this incident). Of the total of 38 incidents, 35 involved 1 or 2 animals, which is the vast majority of incidents. A total of 26 incidents involved only 1 animal and 25 of these attacks (96.2%) were fatal. Of the 9 claims where 2 animals were involved , 9 were fatal, but in 7 (77.78%) of these cases only 1 of the 2 animals was killed and eaten. Only in 2 attacks (22.2%) both animals attacked were killed (in one case the 2 animals killed were dogs). These results are summarised in the following figure.



There are no livestock kill data available from the time before the establishment of the reserve, because these data were not systematically collected at the time. The reserve staff started to collect data on livestock kills in May 2002, about 5 months after the reserve was established in December 2001. Villagers were encouraged to report livestock kills, and we assume that the majority of kills found by villagers in the meantime had indeed been reported when the Jilin government authorities announced that compensation payments



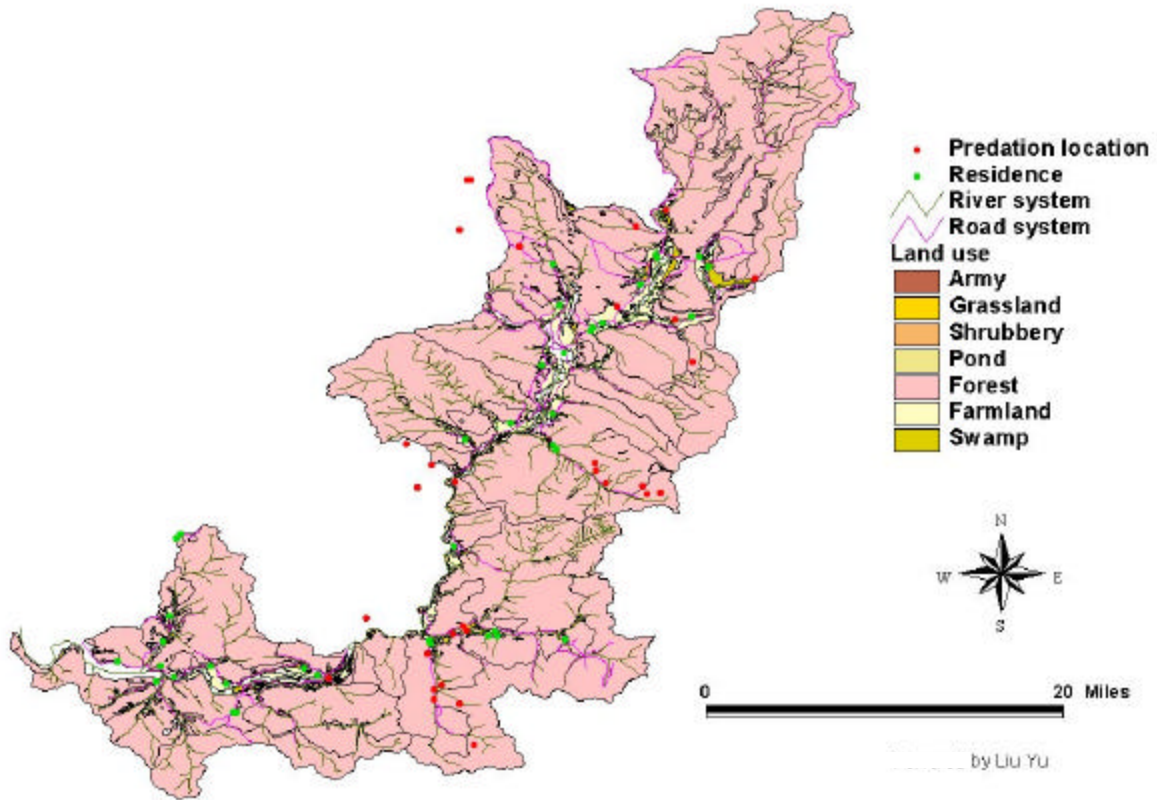
would be made shortly after the establishment of the reserve. However, the actual number of kills is probably considerably higher than the 79 kills included in the predation and compensation table. Some remains of kills may not have been found by villagers in time to prove the cause of death, and the motivation of villagers to report kills diminished after the government postponed compensation payments time and again, until the first actual compensation payments were finally made in July 2004. No kills were reported from August to November 2003, whereas 15 kills were reported in the first 7 months of data collection between May and December 2002. This gap in reported kills does not mean villagers did not find kills; it is probably the result of a lack of willingness of villagers to report kills.

Reserve staff investigate every reported kill or attack on livestock. Staff members visit the site and take pictures of the site, pugmarks (if any), injured livestock and the remains of livestock killed. In many cases the staff determine the location with GPS (a map with livestock kill locations will be included in the final report).

All livestock kills are attributed to tigers. The most common livestock species are cattle and horses, and these animals are too large to be suitable prey for leopards. Pigs are held in pens close to houses, and sheep are not very common and are guarded by shepherds. Cattle are more common than horses and both livestock species are killed in correspondence to their availability (i.e. tigers do not seem to prefer one species to the other). Cattle and horses graze freely between March and November (when there is no snow cover, and the animals do not need to be fed) and often wander several kilometres from the nearest settlement. Tigers make few kills near settlements: of 22 livestock kills with exact known locations 17 occurred more than 3 km and only 2 less than 1 km from the nearest settlement.

The livestock kill data make clear that livestock form the main prey items for Amur tigers in and around the Hunchun reserve. It is difficult to determine exactly the ecological importance of livestock as tiger prey in this Russian-Chinese tiger population, because the exact number of livestock kills and tigers is unknown and it is also unknown what percentage of time tigers spend on the Chinese side of the border. Based on the tiger monitoring data (see next paragraph) and livestock kill data we estimate that tiger food in this part of China consist for at least 60% of livestock kills. The large number of livestock kills is probably the result of low densities of wild ungulates (see paragraph on population monitoring). Husbandry practices also play a major role: cattle and horses graze freely in forests and fields from March to November when there is no snow cover and the animals do not need to be fed. As a result, most kills are made during this period. During winter cattle and horses graze in large, unguarded fenced off fields and forest areas where they receive additional fodder. Tigers have easy access to the fenced off areas. However, probably due to the proximity to humans, tigers make fewer livestock kills from November to March when livestock is grazing in these areas.

The map below provides the locations of the livestock predations that were included in the analysis that we discussed above.



5. Conservation network

The reserve involves villagers from 3 villages in a “conservation network”. The network members receive modest payments for participation in anti-poaching and education activities organised by the reserve. The villagers involved in anti-poaching should for instance report tracks of leopards and tigers and assist in the removal of snares.

On January 5, 2005, a training workshop for members of the network was organised in Chunhua town, Hunchun. Approximately 20 people attended, including several staff members of a forestry farm interested in the training. The participants were taught how to trace tiger tracks, how to identify and measure tiger, leopard and ungulate footprints, how to use GPS and cameras, and how to record of livestock attacks. The participants were taken nearby fields covered with snow to practice what they had learned. Some of the participating villagers delivered snares they had removed in their daily life.



6. Population monitoring

The livestock kills that villagers report to the reserve form a source of information on the presence of tigers. On the basis of livestock kills, inspected pugmarks, beds where a tiger rested, scrapes, scats, and predation spots, as well as samples of tiger hair and scats, biology student Liu Yu estimates that 6 tigers occur in the reserve, one of them a subadult. Encouraging was the discovery of tracks of a tigress with a single cub close to the Russian border in the central part of the reserve in 2004. This was the first sign of tiger reproduction in China in many years. Ungulate monitoring in the more remote northern part of the reserve, with methods similar to the ones used in Russia, indicate that ungulate numbers remain suppressed and are lower than on the Russian side of the border (unpublished paper by biology student Wy Yue). However, additional research will be needed to understand more about the factors that contribute to the suppressed ungulate densities and to develop solutions.

7. Discussion and plans for the future

WCS and the reserve have made very good progress with the implementation of conservation projects in and around the Hunchun nature reserve. The results of two social survey show that opinions and attitudes concerning the reserve and tiger conservation have improved very considerably. Another positive sign was the presence of a tigress with a single cub was documented in the centre of the reserve. However, not all news is positive. Wild ungulate populations remain suppressed. There is still insufficient information available about the factors that cause this suppression. The low ungulate numbers are probably due to a combination of factors, including disturbances caused by logging and other human activities, competition for food with livestock and continued poaching, but additional research is needed. It is also worrying that no tracks of leopards have been documented. Leopards probably suffer more from the low densities of wild ungulates than tigers, because local livestock (mostly cows and mules) do not form suitable alternative prey for leopards. Tigers depend to a very large extent on livestock as a food source in and around the reserve.

WCS China would like to continue the education activities described in this report. Compensation payments will also be continued, but WCS hopes local authorities will start financing the payments in the near future. WCS also hopes to continue the social surveys, but not on an annual basis (probably once every 2 or 3 years).