

# **WORKSHOP TO DEVELOP A RECOVERY PLAN FOR THE WILD NORTH CHINA TIGER POPULATION**

## **PROCEEDINGS**



**Harbin, Heilongjiang Province  
October 20<sup>th</sup>-23<sup>rd</sup>, 2000**

**Sponsored by:  
Heilongjiang Forestry Administration  
U.S. Fish and Wildlife Service's  
Rhinoceros and Tiger Conservation Fund**

**And organized by:  
Heilongjiang Forestry Administration  
The Wildlife Conservation Society**



# **Proceedings of the Workshop to Develop a Recovery Plan for the Wild North China Tiger Population**

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Heilongjiang Forestry Department  
U.S. Fish and Wildlife Service's Rhinoceros and Tiger Conservation Fund

## **Organized by:**

Heilongjiang Forestry Department  
The Wildlife Conservation Society

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## Table of Contents

PREFACE.....	v
INTRODUCTION FOR WORKSHOP.....	1
Schedule.....	2
Greetings from the Government of Heilongjiang Province.....	5
Congratulatory from Department of Wild Fauna and Flora Conservation, State Forestry Administration.....	7
Welcome! From College of Wildlife Resources, Northeast Forestry University.....	8
Structure for Workshop.....	9
SESSION I. STATUS OF THE AMUR TIGER IN NORTHEAST CHINA.....	11
Changes in Numbers and Distribution of the Amur Tiger in Northeast China in the Past 100 years – Summary Report.....	12
Tiger and Leopard Research in Jilin Province.....	16
A Survey of Amur Tigers and Far Eastern Leopards in Eastern Heilongjiang Province, China 1999.....	20
Status of the Amur Tiger and the Far Eastern Leopard in the Russian Far East.....	32
Overview of Threats to Northeast China Tigers.....	35
SESSION 2. LAND USE PLANS: PROTECTED AREAS, ECOLOGICAL CORRIDORS, AND PRIORITY MANAGEMENT AREAS.....	37
Tiger Conservation Plans in Jilin Province.....	38
Plans and Perspectives for Establishing Tiger Reserves in Heilongjiang Province.....	40
A Proposed International System of Protected Areas for Amur Tigers.....	44
SESSION 3. IMPROVING INTERNATIONAL COOPERATION AND ESTABLISHING TRANSBOUNDARY PROTECTED AREAS.....	52
Status of Tiger Protection in the Russian Federation.....	53
Improving International Cooperation and Establishing Transboundary Protected Areas: Roundtable Discussion.....	54
Recovery of the Wild Tiger Population in Northern China.....	56
SESSION 4. POACHING: THE PROBLEM AND POTENTIAL SOLUTIONS.....	59
Current Attempts to Ban Illegal Hunting in Heilongjiang Province of China.....	60
Poaching and Anti-poaching Activities.....	62
Current Status of Anti-poaching Measures in Jilin Province.....	64
Anti-poaching Measures in Primorski Krai.....	66
SESSION 5. FOREST MANAGEMENT AND ITS RELATIONSHIP TO TIGER CONSERVATION.....	71
The National Forest Protection Project, Forest Management and Its Relation to Tiger Conservation.....	72
SESSION 6. MONITORING THE TIGER POPULATION IN NORTHEAST CHINA.....	75
Monitoring Program for Amur Tigers in Heilongjiang Province.....	76
SESSION 7. COMPENSATION FOR LIVESTOCK DEPREDATION BY TIGERS AND LEOPARDS.....	79
Impact of Tigers and Leopards on Livestock and a Livestock Compensation Program.....	80
A Compensation Program in Khasan Raion, Russian Far East.....	81
Approaches to Reducing Large Predator and Human Conflicts.....	84
SESSION 8. PUBLIC EDUCATION.....	85
Public Education – An Important Component of Tiger Conservation.....	86
Public Education and Siberian Tiger Conservation.....	87
SESSION 9. THE TIGER BONE TRADE IN CHINA.....	92
Prohibition of Trade in Tiger Bone and Related Issues.....	93
SESSION 10. CONSERVATION OF THE FAR EASTERN LEOPARD.....	101
Far Eastern Leopard and Siberian Tiger Conservation Measures.....	102

A Survey of Distribution and Number of Leopards in Eastern Heilongjiang Province, China.....	104
Conservation of the Far Eastern Leopard.....	108
SESSION 12. OPPORTUNITIES FOR SUPPORT FROM THE INTERNATIONAL CONSERVATION COMMUNITY.....	109
Rhinoceros and Tiger Conservation Fund of the U.S. Fish and Wildlife Service.....	110
Zoological Society of London and 21 <sup>st</sup> Century Tiger.....	111
APPENDICES.....	112
Appendix 1. Resolution of the International Workshop to Develop a Recovery Plan for the Wild Amur Tiger Population in Northeast China.....	113
Appendix 2. Protocol Between the Government of Russian Federation and the Government of the People’s Republic of China On Tiger Protection.....	115
Appendix 3. List of Participants.....	116

## PREFACE

The urgent need for this workshop arose out of the results of two surveys conducted in 1998 and 1999. Until that time, reports coming out of China led many outside observers to believe that there were perhaps 30 or more wild Amur tigers (*Panthera tigris altaica*) still left in the northeast provinces of Jilin and Heilongjiang. With the status of Amur tigers in the Russian Far East relatively well understood following the 1996 full-range survey and the implementation of a monitoring program, the time arrived to move on to one of the next logical step in Amur tiger conservation planning, namely, to determine whether a viable population of tigers remains in northeast China, whether these tigers maintain a connection with populations of tigers on the Russian side of the border, and what are the opportunities for conserving tigers in northeast China.

After several years of planning, an international team of Chinese, Russian, and American experts finally conducted these two surveys. The results, on the one hand, were alarmingly disappointing, while on the other, they provided reasons for optimism. The data suggest that there no longer exists a resident, stable population anywhere in northeast China, and that, with the possible exception of the Eastern Wandashan Mountains, no reproduction of young is occurring. The results indicate that Amur tigers exist in northeast China largely as nomadic, isolated individuals, and that there is no breeding nucleus to sustain this population. The conclusion is that the Amur tiger is on the verge of extinction in northeast China, and that it is presently sustained by emigration of individuals from Russia.

Despite the dire situation, there are a number of reasons for optimism. Firstly, the field surveys indicate that there exist large tracts of intact forests, heavily harvested, but nonetheless suitable habitat that can support prey populations and tigers in Heilongjiang and Jilin Provinces. Secondly, there exist at least three areas where connectivity with the Russian population of tigers is maintained by continuous tracts of forests across the international border. Tigers clearly can, and occasionally do, cross the border, meaning that if suitable habitat is protected, tigers can naturally colonize this region. Finally, and perhaps most importantly, there appears to be a sincere interest on the part of many government officials, as well as local people, in tiger conservation. ***This combination of factors makes northeast China one of the few places in the world where natural recovery of tigers, without significant human intervention, is a very real possibility.***

Given this possibility, there appeared to be an urgent need to bring together the key representatives and vested players who could change the direction of the tigers headlong plunge towards extinction in China. A list of such “vested players” includes, of course, local and national specialists on tiger conservation, and government officials (both provincial and state-wide) who are responsible for natural resource management. Russian tiger specialists and government officials need to discuss transboundary management issues. And representatives of the international community need to show support for the process, both morally and financially.

Such a group convened in Harbin, Heilongjiang, between October 20-23, 2000, to assist in the development of a recovery plan for the tiger. The US Fish and Wildlife Service’s Rhinoceros and Tiger Conservation Fund, the Provincial Forestry Administration of Heilongjiang, and the Wildlife Conservation Society funded this workshop. The objectives of the workshop were clearly defined:

- a) develop a recovery plan to be submitted to the State Forestry Administration and that will hopefully be incorporated as part of a Federally approved recovery plan;
- b) include in the recovery plan a set of specific, concrete conservation actions that will lead to recovery of China’s wild Amur tiger population; and,
- c) encourage international organizations interested in tiger conservation to participate in the recovery process in Northeast China.

The workshop was broken up into 12 sections that either represented potentially key components of a proposed Action Plan, or that addressed key issues in implementing such an Action Plan. Key topics were introduced in a series of presentations, followed by “break-out” sessions in which session leaders focused participants on developing key recommendations to be

included in an Action Plan. Most topics were too problematic or controversial to resolve during the relatively short time available for discussion, and therefore small groups were created from the break-out sessions to come up with concrete recommendations for action. These recommendations were presented on the final afternoon of the workshop (Session 11, which is not included here, as it represents the initial outline of the Action Plan). This final day was also an opportunity for representatives of potential funding organizations to present their perspectives and interests in supporting tiger conservation in northeast China (Session 12). Finally, a resolution was discussed and adopted by all workshop participants.

These proceedings represent a summary of the workshop process, and are not an end product. This document includes most of the presentations given at the workshop, as well as other key documents, such as the resolution. These proceedings are a complementary document to the proposed Action Plan, which is currently being developed. This Action Plan represents the workshop's final product – one that all participants hope the State Forest Administration will adopt, and most importantly, one that will be implemented.

The northernmost subspecies of tigers, *Panthera tigris altaica*, has many names – the Siberian, Amur, Northeast China, and Korean. The animal is the same, despite the variety of names. This array of names is indicative of its once widespread distribution across northeast Asia, and provides a hint of the difficulties of trying to conserve a unique animal, which ranges across a multitude of international boundaries.

Tiger conservation in northeast China is at a crossroads. Tigers could easily go extinct in a matter of a few years. However, like few other places in the world, there is a great opportunity for the tiger population to recover naturally, and without human manipulation. What is required is that some of the existing forest lands be protected, that prey populations be allowed to grow (thereby providing a forage base for tigers), and that a tolerant attitude be adopted by the local people and local governments. These tasks are formidable, but all are achievable, and the opportunity exists for northeast China to be an example to the world in how to recover wild tiger populations. These proceedings provide the first glimpses of the road that must be traveled, not by tigers, but by us humans. If we have the fortitude and courage to take these steps, the future of tigers in northeast China could look very bright indeed.

Dale Miquelle  
Endi Zhang

# **INTRODUCTION TO WORKSHOP**

**Schedule, Greetings, and Structure of Workshop**

## SCHEDULE

### October 20<sup>th</sup>: arrival

5:00 p.m. Reception at the Friendship Palace Hotel

6:00 p.m. Dinner Buffet

### October 21<sup>st</sup>

9:00 **Chairman:** Wang Yingchen, Vice Director of Heilongjiang Forest Department

**Welcome:** Ma Jiangzhang, Professor, Wildlife Resources College, Northeast Forestry University  
Han Lianshen - Vice Director of Heilongjiang Forest Department

### **SESSION 1. Status of the North China Tiger**

#### **Session Chairman: Wang Yingchen**

9:30 History of tigers in Northeast China: Ma Yiqing

9:50 Survey of tigers and leopards in Jilin Province. Jiang Jinsong

10:10 Survey of tigers and leopards in Heilongjiang Province: Yu Xiaochen

10:30 Break

10:50 Status of tigers in Russian Far East – D. G. Pikunov

11:10 Chinese Conservation Strategy for Tigers – Wang Weisheng

11:40 Overview of threats and outline for workshop processes – D. G. Miquelle

12:00 – 1:30 Lunch

### **SESSION 2. Land Use Plans: Protected Areas, Ecological Corridors, and Priority Management Areas.**

#### **Session Chairman: Dale Miquelle**

1:30 Plans and potentials for establishing tiger reserves in Jilin Province – Wu Zhigang

1:45 Plans and potentials for establishing tiger reserves in Heilongjiang Province – Sun Haiyi

2:00 Breakout into two groups for discussion of priority areas and mechanisms to move the process forward.

Discussion Coordinators for Jilin Zhang Chuanjun & Dale Miquelle

Discussion Coordinator for Heilongjiang: Cui Guanfang & Endi Zhang

3:30 Report and discussions on action plans from breakout groups

4:00-4:30 Break

### **SESSION 3. Improving International Cooperation and Establishing Transboundary Protected Areas: Roundtable discussion**

#### **Session Chairmen: Dale Miquelle and Endi Zhang**

4:30 The Russian-Chinese Cooperative Agreement:

4:35 Wang Weisheng

4:45 Kolonin, G. N.

5:00 Stomatyuk, E. N.

5:15 Kryukov, V. G.

5:30 wrap up of round-table and definition of process for moving forward

6:00 Dinner

**October 22<sup>nd</sup>****SESSION 4. Poaching: The Problem and Potential Solutions****Session Chairman: Wang Weisheng**

9:00 The poaching problem: results from surveys – Sun Haiyi

9:10 The status of anti-poaching programs in Northeast China. Cui Guangfan (Chief of Division of Wildlife Management, Heilongjiang Wildlife Department, and Zhang Chuanjun (Jilin Province)

9:30 Anti-poaching programs in Russia. - S. Zubstov

**SESSION 5. Forest Management and its relationship to tiger conservation****Session Chairman: Wang Weiyang**

9:45 The National Forest Protection Plan, Forest Management and its relation to tiger conservation – Zhou Xuanbing

10:00 – 10:20 Break

10:20 Breakout and discussion groups

Discussion Coordinator for anti-poaching: Zubstov and Cui Guangfan

Discussion Coordinator for Forestry: Sun Baogang and Zhang Chuanjun

11:30 Report from discussion groups on action plans

12:00-1:30 Lunch

**SESSION 6. Monitoring the Tiger Population in Northeast China****Session Chairman: Cui Guanfang**

1:30 A monitoring program for North China tigers in Heilongjiang – Yu Xiaochen

1:45 Discussion on monitoring programs: Coordinator: Ma Yiqing

**SESSION 7. Compensation for Livestock Depredation by Tigers and Leopards****Session Chairman: Dale Miquelle**

2:15 A compensation program for livestock depredation – Pavel Fomenko, Li Tong, M. Hotte, S. Bereznyuk and other participants

2:30 Discussion

2:45 - 3:15 Break

**SESSION 8. Public Education****Session Chairman: Liu Zhongmin**

3:15 Public Education – Endi Zhang

3:30 Public Education in Heilongjiang – Jin Songyan

3:45 Discussion

**SESSION 9. The Tiger Bone Trade in China**

4:15-4:45 Meng Xianlin

**SESSION 10. Conservation of the Far Eastern Leopard: Roundtable Discussion****Session Chairman: Dale Miquelle**

4:45 Far Eastern Leopard Conservation: linking to tigers

Discussion Leader: Dale Miquelle

Jilin: Han Xiaodong

Heilongjiang: Sun Haiyi

Russia: Stomatyuk

Russia: Pikunov

5:30 Close of session, plans for next day

6:00 Dinner

### **October 23<sup>rd</sup>**

9:00 – 12:00 Completion of forms for each workgroup and write-up of key points of discussion (responsibility of group leader and team members).

12:00-1:30 Lunch

### **SESSION 11. Formal Presentation of Action Plan Components**

**Session Chairman: Endi Zhang**

1:30 **Action Plan: Protected Areas, Ecological Corridors, High Priority Management areas**

1:45 **Action Plan: International Agreements and International Protected Areas**

2:00 **Action Plan: Anti-poaching**

2:15 **Action Plan: Forestry Management in relation to tiger conservation**

2:30 **Action Plan: Monitoring Program of tigers and prey**

2:45 **Action Plan: Compensation Program**

3:00 **Action Plan: Public Education**

3:15 **Action Plan: Far Eastern Leopard**

3:30-4:00 Break

### **SESSION 12. Opportunities for support from the international conservation community**

4:00-4:45 (presentations by any organization can be made here if they have concrete plans on how to provide potential support to conservation of China tigers and leopards)

4:45 **Conclusion:** Miquelle

4:50 Closing of workshop

5:00 Press conference

6:00 Banquet

### **October 24<sup>th</sup>** (for those interested)

Guided tour of areas of local interest

**GREETINGS  
TO THE WORKSHOP TO  
DEVELOP A RECOVERY PLAN FOR THE WILD NORTH CHINA TIGER  
POPULATION**

Guo Baofu  
Vice-Secretary-General  
Government of Heilongjiang Province

Good morning, Ladies and Gentlemen, Scholars and Friends:

At this time, the Workshop to Develop a Recovery Plan for the Wild Siberian Tiger Population is officially opened in Harbin, China. On behalf of the People's Republic of China and the government of Heilongjiang Province, I congratulate you for the successful convening of the workshop. We welcome each of the specialists and scholars who have come from all over the world, from the United States, Britain, Russia, South Korea, Holland, and China. The workshop is sponsored by the Forestry Department of Heilongjiang Province and the Wildlife Conservation Society (WCS), with the aid of Rhinoceros and Tiger Conservation Foundation (RTCF) of the United States Fish and Wildlife Service (USF&WS) and the Heilongjiang Wildlife Institute. We express our heartfelt thanks for their help and support, and are especially thankful for the energetic support and funding provided by WCS. We sincerely hope that we can promote mutual understanding and friendship among people of all countries through this meeting. We also hope that every specialist and scholar will have a chance to provide valuable experience in developing a recovery plan.

Heilongjiang Province, a huge area covering 45.4 thousand km<sup>2</sup>, is located in northeast China and possesses abundant resources and vast forests. There are 2,300 species of plants and 456 species of wildlife. The faunal complex includes 87 mammals, 358 birds, 16 reptiles and 12 amphibian species. We have many precious species, of which the Siberian tiger is the most outstanding representative. Historically, the Siberian tiger ranged very extensively in northeastern forests. However, in the past century, with increased human activity, Siberian tiger habitat shrank, and the population declined significantly. In the 1970s, the Siberian tiger disappeared in Daxing'an Mountains, and then, in the 1980's, in the Xiaoxing'an Mountains. These events caught our attention and we have carried out several surveys to monitor population dynamics. Meanwhile, some active countermeasures have been adopted to preserve tigers in the wild, such as establishing specific natural reserves. In 1986, China Hengdaohezi Feline Animals Breeding Center was established. Artificial breeding techniques were also developed in Harbin Zoo; we achieved two litters of five cubs a year in 1982. Since 1996, we have maintained a captive population of more than 100 tigers. We established the Siberian Tiger Park in which some staged preparatory experiments for release in the wild were conducted. We are waiting for animals to mature to release them into the wild. At the same time, we have improved legislation and law enforcement. We passed various kinds of laws and rules and routinely inspected enforcement efforts. Poaching has significantly declined due to punishment of poachers. Even so, the Siberian tiger is a large carnivore located at the top of the food chain. It needs abundant food source and vast habitat. Therefore, the tendency toward population decline, from 81 tigers in 1976 to 5-7 today, continues. At the same time, in our adjacent province, Jilin, the total number of Siberian tigers is only between 9-13. This means our efforts to protect the tiger have come too late and we still have many problems. The Chinese have a saying: It's not too late to mend the fold after a sheep is lost. I hope all the experts attending the workshop have a chance to learn more about the endangered status of the Siberian tiger in Heilongjiang, to evaluate the conservation measures we have undertaken and to provide constructive suggestions. I promise you that we will seriously consider them. I believe the recovery of the tiger in our province depends on an exchange between tiger populations in China

and Russia. It also depends on the intelligence and coordination of all the scientists here, and especially, on the cooperation of Russian scientists. I hope that we have a chance to enhance our mutual understandings, cooperation and friendship for one another and to develop some common consensus on establishing ecological corridors, on coordinating conservation and economic development, on public education and on preventing poaching. We have an obligation to come up with scientifically reasonable and practical ways, to save the Siberian tiger.

Finally, I wish the workshop success in achieving its goals, and I wish all the representatives an enjoyable working atmosphere and good health.

## CONGRATULATIONS

From  
Department of Wild Fauna & Flora Conservation  
State Forestry Administration,  
People's Republic of China  
Oct. 21, 2000

The International Workshop to Develop a Recovery Plan for the Wild North China Tiger Population, co-sponsored by Heilongjiang Provincial Forestry Department of the People's Republic of China and the Wildlife Conservation Society (WCS), opens today in Harbin, China. The Department of Wild Fauna & Flora Conservation of State Forestry Administration of P.R. China wishes to congratulate everyone with the convening of this workshop, and wishes to extend a warm welcome to all representatives and experts from China and from around the world.

Historically, tiger was widely distributed across vast regions of the world. It plays an irreplaceable role in sustaining regional ecosystems and also is deeply rooted in traditional human cultures. However, for historical reasons and due to a lack of attention, the tiger has become one of the most endangered species, with three subspecies already extinct and the others facing various threats. To remove the species from its endangered status, many countries, organizations and conservationists have put forth great efforts, and have achieved effective results which have increased hopes to recover this species allow natural development of its population. The above efforts and results deserve our very appreciation.

China is at the heart of the world's tigers range, and the Chinese government pays special attention to the protection and conservation of existing tiger populations. After passage of the *P. R. China Law for Wildlife Protection* in 1988, all tiger species were given priority national protection status and were placed on the *List of Specially Protected Wildlife*, meaning hunting and killing the tiger became illegal. Simultaneously, an effort was launched to establish nature reserves, to survey of wild populations, to conduct scientific research, to develop captive breeding facilities, and to foster international cooperation. Understanding that the production and trade of tiger products place tremendous pressure on the tiger population, the State Council of P.R. China issued a special order in 1993 to prohibit all commercial utilization and trade of any tiger products including, bone and any parts of tigers and their derivatives. Moreover, to fully promote the recovery and protection of the tiger in China, the State Forestry Administration of P.R. China is developing a *National Strategy for Conservation of Tigers in China* and is preparing to implement the Strategy. Certain components of the Strategy are already being implemented.

Recovery and protection of tigers is a long-term and very valuable mission that has certain implied risks, problems, and difficulties implied, as well as providing a challenge to our ability to use international conservation techniques to achieve these aims in a spirit of human cooperation. As we enter the new century, the convening of the International Workshop to Develop a Recovery Plan for the Wild North China Tiger Population is the beginning to an international cooperative spirit that can support recovery and protection of tigers in China and that will be a new beginning to the recovery of the wild Amur tiger population in China. We believe that a united, arduous and ongoing effort by everyone who cares about tigers, if undertaken in the spirit of human wisdom, will lead to a prosperous future in China in the coming new century for this beautiful and mysterious animal.

Finally, we wish the workshop every success.

**WELCOME**

Ma Jianzhang  
College of Wildlife Resources, Northeast Forestry University  
Harbin, Heilongjiang, China

Ladies and gentlemen:

Thanks to the sponsorship of the Heilongjiang Forestry Department and the Wildlife Conservation Society (WCS), the workshop to develop a recovery plan for the wild Amur tiger population now officially opened in Harbin - the "Paris of the East." Conservationists and specialists from both inside and outside China are meeting here to discuss the problems facing the wild Amur tiger populations and to work out a recovery plan for this endangered species. This is a great event for all of us. I would like to first of all convey my personal congratulations to its sponsors for holding the workshop and extend my warmest welcome to all our Chinese and foreign colleagues! I would also like to thank the workshop secretariat for all its hard work! And thanks to the Heilongjiang Forestry Department, the Wildlife Conservation Society and the US Fish and Wildlife Service for your financial support!

In the past half century, China's wild Amur tiger population has declined dramatically. In the middle of 1970s, there were 150 Amur tigers living in China, this according to survey results, yet the number dropped to 20-30 in the middle of 1980s and the current count indicates that only ten individuals exist in northeast China. Such a statistic shows just how amazingly quick the wild Amur tiger population has shrunk! The species is now extremely endangered, and the day it goes extinct might not be far off if immediate actions are not taken. The Chinese government has taken significant steps to save the wild Amur tiger from extinction through the establishment of natural reserves in the Amur tiger habitat. In 1986, in an effort to preserve its gene pool and to maintain animals for future reintroduction, a cat-breeding center was opened which has had great success in breeding Amur tigers. At the same time, specialists from international organizations are contributing to the effort to save the wild Amur tiger in China.

The effort to protect the Amur tiger, as an element of the natural environment, is more than just promoting sustainable development, it is a challenge to current civilization. In addition to the tiger's well-known ecological significance, it is also a symbol of grace and power. The Amur tiger is the largest of the world's tigers and it is the most beautiful of all the striped tiger subspecies. It is a tragedy that this legendary animal is now on the verge of extinction in China. Let us extend a helping hand and call for swift action to save the species! We cannot allow the animal to disappear from the wild in our age!

Dear friends and comrades: the Amur tiger and other wild animals are friends to humans. They are very important to the survival and development of human society. It is our common obligation to protect the Amur tiger, and this is especially true of the people who live in its habitat and who bear a special responsibility. We still have a long way to go before wild Amur tiger populations recover in China. And we must work together to move this process forward. This workshop provides us a unique opportunity to communicate with and learn from each other, to exchange ideas and to promote mutual cooperation. I hope we can take advantage of the opportunity to make progress on conserving the wild Amur tiger.

In conclusion, I wish the workshop great success and all its participants a pleasant stay in Harbin!

## STRUCTURE FOR THE WORKSHOP

Dale Miquelle and Endi Zhang  
Wildlife Conservation Society

The intent of this workshop is to delineate the key problems that have nearly caused the extinction of tigers in North China, and to determine what steps need to be taken to allow wild North China tigers to recover and become a viable, self-sustaining population. With this specific objective in mind, the structure of this workshop differs from most such meetings in that it is “product-driven.” Our goal in bringing together specialists from around the world with governmental representatives from both China and Russia is to seek the necessary means to insure survival of tigers in the wild in North China. Our goal is to define those steps that must be taken, and how they must be taken, within the time constraints of our workshop. To be successful, everyone must keep this goal in mind: to produce a set of recommendations and a working plan to save tigers in North China.

The workshop is designed to develop such a product. The series of presentations in the morning of October 21<sup>st</sup> provide background information on the status of tigers (and leopards) across northern China, as well as nearby Russia. The last session before lunch will map out the process for developing a recovery plan in the few days available during the workshop (repeating much of what is presented here).

After lunch, we start in on the first of 10 sessions designed to address specific components of a recovery plan. Each session has a similar design. In each session one or two short presentations describe the present situation, and are followed by “break-out” sessions, in which smaller groups gather together to develop a specific set of recommendations to address that specific problem. During each break-out session it will be the responsibility of session leaders to fill-in a worksheet with a standardized framework that includes the following 4 categories:

- 1) **Present situation** - this information should be provided in the initial presentations in each session, and need not be repeated during the break-out session unless further clarification is required;
- 2) **Key problems** – what are the barriers or problems that prevent improvement of the present situation. Problems may be biological, political, international, logistical, or financial. It is not necessary, nor desirable, to attempt to provide an exhaustive list. Rather, it is important to limit discussion to the most critical problems, and not try to address every potential obstacle that might exist. Our task is to identify those key obstacles to recovering tigers in North China. This is the critical component of the exercise because the list of problems will define what actions need to be taken, and may direct future political and management decisions.
- 3) **Recommendations** – Based on the list of problems, a set of recommendations should be developed that will act to resolve defined problems. As with the list of problems, recommendations may be related to biological, political, international cooperation, or others. The key point is that recommendations that are proposed should resolve existing problems if properly implemented.
- 4) **Responsible agencies/organizations** – Associated with each recommendation should be a list of organizations or agencies that are charged with responsibility to implement proposed recommendations. In some cases, it may be desirable to create special working groups to implement some recommendations. The important point here is to identify those organizations that have the capacity to resolve problems by implementing proposed recommendations.

Because some break-out sessions will be run simultaneously (usually two at a time), all participants must decide which session they want to attend. At the end of each break-out session, all participants gather together again, and a representative from each group will present the results of that session to the entire audience, at which time there will be an opportunity to discuss key

points. If there is need for follow-up work, we may assign a small group of people to continue working on each section.

An example of this process is as follows: in the afternoon of the first day, presentations from Jilin and Heilongjiang describe existing status of plans for protected areas in the respective provinces. After that, workshop participants split into two groups – one to discuss protected areas planning in Heilongjiang, and a second in Jilin. The chairperson of each group will lead a discussion of the problems associated with protection of tigers in the respective provinces, and the adequacy of existing protected areas. Then they will lead a discussion of recommendations to improve the existing situation (for example, recommendations for new protected areas, status of protected areas, need for international cooperation for transboundary protected areas) and define those organizations that can assist in implementing recommendations. After that list is developed, both groups (from Jilin and Heilongjiang) will join together, and there will be a presentation of the problems, recommendations, and organizations proposed to address the issue. Each of the presentations will be followed by a discussion. If the general discussion demonstrates that much more work is required, then a small group of 2-4 people will be assigned to develop the program for each session further.

Nine such sessions will be conducted in this format during the first two days of the workshop. During free time (evenings, breaks) it is the responsibility of chairperson of each session to pull together recommendations during general discussions, and write up a more comprehensive description of the problems and recommendations. The morning of October 23<sup>rd</sup> is free for interested parties to work together to pull together a comprehensive plan for each session. This edited, and more comprehensive program for each session will be presented at the next to final session (Session 10). These presentations can be subject to debate, but they will hopefully represent the final product of our workshop. These presentations should be well developed so that they can be incorporated into a printed document that represents the recommendations derived from the workshop process.

At the end of these nine presentations, we will also attempt to forge a consensus on a resolution that can be adopted by the participants of the workshop. This is a process we will work on throughout the workshop to gather consensus on what should be incorporated into a resolution.

The final session (Session 11) will begin to address financial issues related to implementation of a recovery plan. International funding organizations will have the opportunity to make short presentations on their potential roles in assisting recovery of tigers in North China. Their willingness to assist may largely be dependent on how well we demonstrate the need and the capacity to implement a recovery program. Therefore, it is in the interest of us all to work together to develop a comprehensive and realistic program for tiger conservation in North China.

We look forward to this exciting opportunity to work with you.

## **SESSION I. STATUS OF THE AMUR TIGER IN NORTHEAST CHINA**

### **Introduction to Session 1.**

As a premise for making recommendations for conservation, it is first imperative to understand the status of tigers in northeast China, their relationship to other populations of tigers, and to understand something about the historical status of tigers in the region, as a means of comparing present to past conditions. The purpose of this first, introductory session is to provide an outline of our existing knowledge of tigers in both Jilin and Heilongjiang Provinces, and about the neighboring population of tigers in Primorskii and Khabarovskii Krai in the Russian Far East. We therefore requested that a representative from each province, as well as from Russia, provide an update of the most recent information on tigers in each area. Additionally, we requested Ma Yiqing, a noted biologist who has collected considerable information on the historical status of tigers in northeast China, to start this session and to provide us with an historic perspective of the original distribution of tigers in northeast China, and of the reasons for their decline. The final paper provides an overview of the threats facing tigers in Northeast China, based on survey results in Jilin and Heilongjiang.

# CHANGES IN NUMBERS AND DISTRIBUTION OF THE AMUR TIGER IN NORTHEAST CHINA IN THE PAST 100 YEARS – A SUMMARY REPORT

By Ma Yiqing

Heilongjiang Nature Resources Institute, Harbin, China

## 1. Significance of the Project

International experts assembled in Harbin to discuss how to develop a tiger survey in Heilongjiang Province after a survey to look at the current status of the Amur Tiger along the border between China and Russia in Jilin Province was completed. During that discussion, participants noted that it is extremely important and urgent to discover why the Amur tiger has become endangered in the last one hundred years. Carrying out the survey and studying the results not only has practical significance, it set the theoretical groundwork for tiger conservation and for the creation of nature reserves.

The Amur Tiger (*Panther tigris altaica*) is a large animal. Tigers are at the top of the natural food chain. Because it has few natural enemies except for parasites and diseases, the factors affecting Amur tiger survival and reproduction in the wild are specific in nature. We must therefore develop an integrated study to learn the specific reasons why the Amur Tiger has become endangered.

## 2. Methods

The Former Ministry of Agriculture and Forestry organized a survey on “valuable animal resources” in 1975, and in three provinces, i.e. Liaoning, Jilin and Heilongjiang, wildlife, including the tiger, were surveyed. The survey showed that the Amur Tiger is rare and its natural range greatly reduced. A result of the survey was that scientists and other relevant officials in China began to pay more attention to the tiger. Based on survey results and other data gathered at that time, historic changes and processes causing a reduction in Amur Tiger’s range were studied (Ma Yiqing, 1979, 1983). Scholars (Wang Zhengtang, 1993; Feng Jiang et al., 1993; Cheng Jizhen 1993; Li Tong et al. 1993; Xu Xueliang, 1993) approached the issue from various methodological angles.

Our process began with a reading of local chronicles. We systematically collected all historic records on Amur Tiger distribution. Certain limits to historic data forced researchers to read between the lines of what was collected and examined. Given the specific factors affecting Amur Tiger habitat - forests, roads, agriculture lands, human population, as well as hunting and capture by humans- we systematically collected, analyzed, and recorded the data, and compiled it in such a way as to provide a basis for further study.

## 3. Mechanism of the tiger become endangered

When the Amur Tiger first came to northeast Chinese forests, the forests of the region consisted of large trees, were home to abundant prey and as of yet, had few human inhabitants. In time, the tiger adapted to the cold conditions and the population grew in numbers and expanded its territory. Historic data indicates that Amur Tiger population covered a large range. The northern extremes of Yanshan Mountain at Chende, in Hebei Province, was its southern limit, and its northern limit was in the Daxin’anling and Shqingke River regions. The eastern border was the Korean peninsula and the west coast of the Japanese Sea.

As human civilization developed, human population gradually increased and forested areas were exploited. Several major events occurred:

1. At the end of nineteenth century, the Central Eastern Railroad, over 1700 km long, was built from Manchuria to Suifenhe and Vladivostok. The forest along a 25 ~ 50 km strip along both sides of the railway were cut within 20 years of the railroads construction.
2. The South Manchurian Railroad that runs from Harbin via Changchun to Dalian - about 1100 km- went into service in 1903.
3. Russia opened a trading company called "Amur Commercial Shipping Company" in 1895;
4. When the city of Yinkou opened in 1909, Yunchun, Harbin, Aihui, Manchuria and Suifenhe also became trading ports. There were numerous foreign businessmen and people began to rush into northeast China. Many Russian hunters entered the forest to hunt tigers. Baikov (1925) estimated that 50~60 tigers a year were killed.
5. Through the 1930s, estimates of between five to eight, and as many as 10 tigers a year were killed. If this is correct, around one thousand tigers were killed during the 1920s and 930s, an extraction rate that exceeds the species' replacement capacity.

Meanwhile, the human population grew rapidly, large-scale forest destruction occurred, railroad and highway density increased. By the end of 1940s, tigers were a rare sight. Tiger habitat was damaged and fragmented, one indication being the decline in the number of tigers hunted. Unfortunately, tiger hunting did not stop in the 1950s, and people continued to catch cubs and kill adult tigers, making the restoration of the wild population even more difficult. More and more people entered the forests in the 1960s, the volume of forest decreased and almost no primary forests remained. This situation is confirmed in documents for the 1976 and 1986 forest survey. The first tiger census conducted in 1974-1976 showed that there were already no tigers in Daxin'anling and Liaoning Province. Only 150 Amur Tigers remained in China and their distribution was limited to a few mountainous areas.

Since the 1980s, small-scale censuses have been conducted both in Jilin and Heilongjiang Provinces, along with a wildlife resource survey of state owned forests in the eastern mountains in Heilongjiang Province. The results found only 12-14 tigers in the region, causing widespread concern. The situation had deteriorated considerably in the 1970s, in large part as a result of deforestation, of an increase in the human population, and because of road construction.

We believe there are several reasons why the Amur tiger is going extinct, and no one single factor is to blame.

#### 4. Conclusion

The Amur Tiger began to disappear in the early 20th century. Tradition held that a successful tiger hunter was a hero. Tiger parts, such as tiger bone, were believed to be a powerful medicine. Thus, tradition encouraged tiger hunting. Half a century of uncontrolled tiger hunting and regular capture of tiger cubs even after the 1950s created a condition whereby elimination exceeded reproductive capacity, and a rapid decline of the tiger population followed.

Large-scale deforestation, increased high railway and road density and repeated military actions in the mountainous forests during the Japanese occupation has destroyed or degraded tiger habitat. These factors have reduced and isolated tiger populations. The decline in population size and a biased sex ratio has caused inbreeding, further aggravating the tiger's decline. These problems were beyond the control of humans by the 1970s. Tiger numbers have dropped from 80 to 12 in 15 years. We must work together to stop this decline.

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Figure 1. Historical records of tigers in northeast China

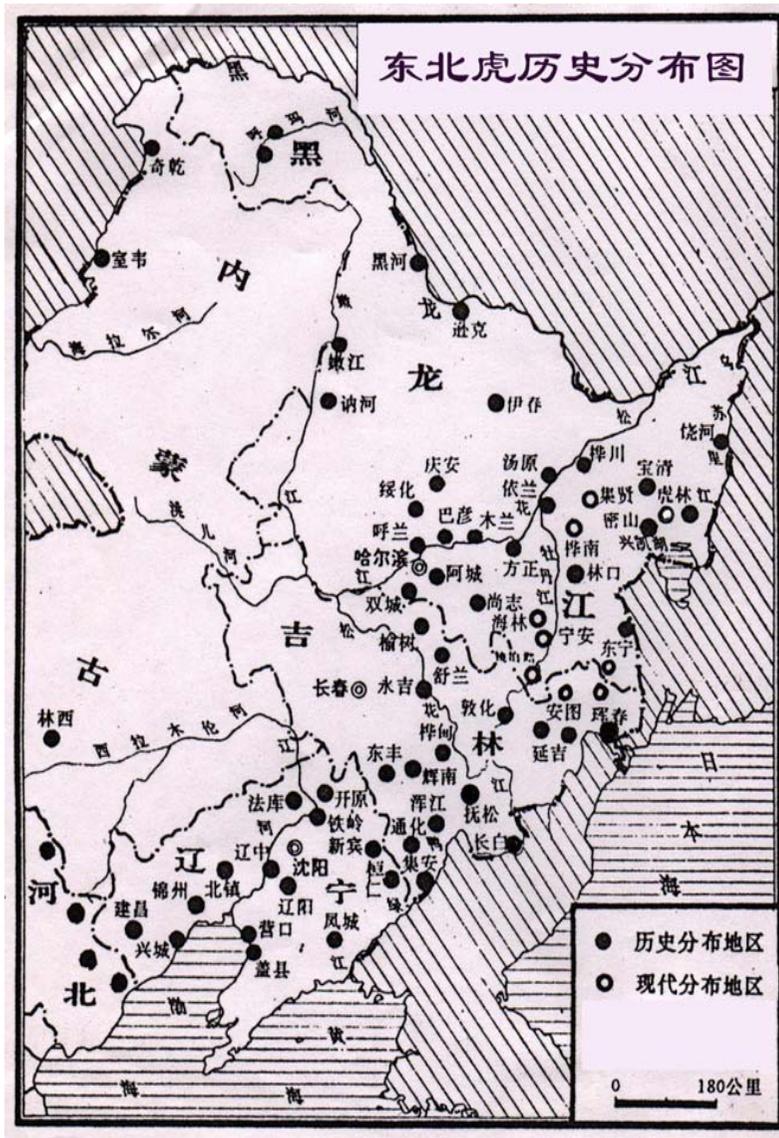
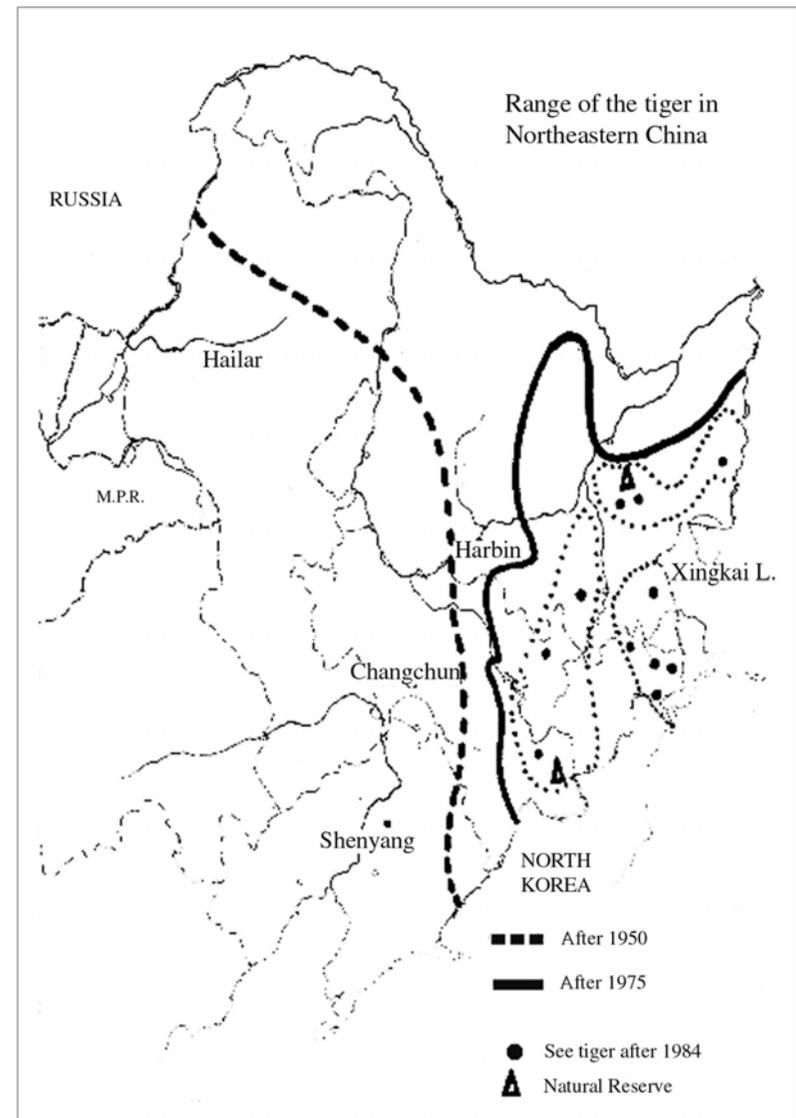


Figure 2. Approximate distribution of tigers in 1950, 1975 as well as point location records after 1984.



# TIGER AND LEOPARD RESEARCH IN JILIN PROVINCE

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Jilin Province is prime tiger and leopard habitat in China and it is important that the Jilin Province Wildlife Bureau studies and monitors the habitat and population size of these animals, that it take necessary measures to protect them and to minimize threats to these species. Supported by UNDP/TRADP, twenty experts from the Jilin Province Wildlife Protection Association carried out a tiger and leopard survey in Jilin Province.

The report of the survey is as follows:

## 1. Work to Date

From May 1992 to March 1994, 191 transects were followed and 176 people were interviewed about tigers and leopards. We located, at a minimum, several possible habitat areas in the Changbai Mountains.

From January 1996 to December 1997, we studied 1,722 transects and located tiger and leopard habitat in the Changbai Mountains.

From February 1998 to May 1999, a special study on tigers and leopards that covered 8,660 km<sup>2</sup> of survey determined population numbers and prey types. During this survey, 18 survey spots and 37 transects were established.

## 2. Results

A) We have a clear picture of tiger and leopard numbers, and their habitat, in Jilin Province.

The number of regions where tigers are found has decreased from six regions in the early 1990s to just three: Dalongling, Harbaling and Zhangguangcailing regions. Tigers have disappeared from the Changbai Mountain, Zhenfengling and Mudangjiang areas.

There were seven to nine tigers on 14 transect lines, where we found evidence in the form of tiger tracks, fur, food remains, excrement, and urine. There are three to five tigers in Dalongling, Harbaling regions, and three in Zhangguangcailing region.

There were leopard tracks on eight transects. Four to seven leopards may exist in two regions: Dalongling and Harbaling - three to six are in Dalongling, and one in Harbaling region.

B) We have a better understanding of tiger and leopard prey.

C) We have begun research to evaluate tiger and leopard habitat.

D) We evaluated the threats to tigers and leopards. Tiger and leopard numbers are directly related to human population density and logging intensity and clearly related to prey density.

E) We have designed a protection program for tigers and leopards that includes three projects:

- 1) Establish a 6,700 km<sup>2</sup> area reserve for tigers and leopards in the middle and northern part of Hunchun city and in the eastern part of Wangqing;
- 2) Set up six ecological corridors at key crossover points into Russia, Korea and China, with a corridor to the Changbai Mountains;
- 3) Establish a tiger and leopard monitoring program to determine priority management needs.

I would like to express my appreciation to UNDP/TRADP for its support and to thank the Wildlife Department of the State Forestry Administration for its instructions, as well as to thank our foreign colleagues for their helpful cooperation.

Figure 1. Map of tiger and leopard distribution in Jilin Province

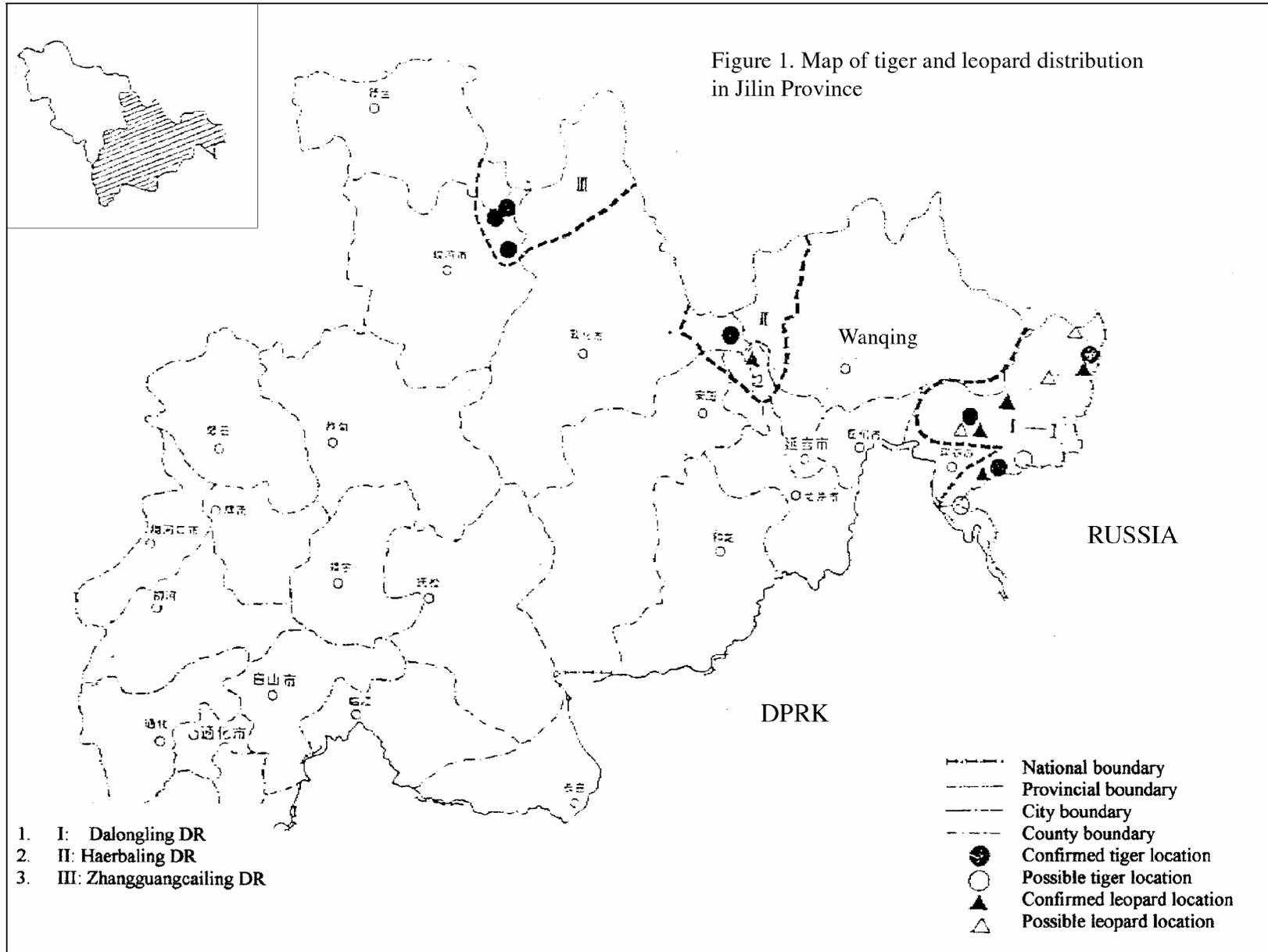
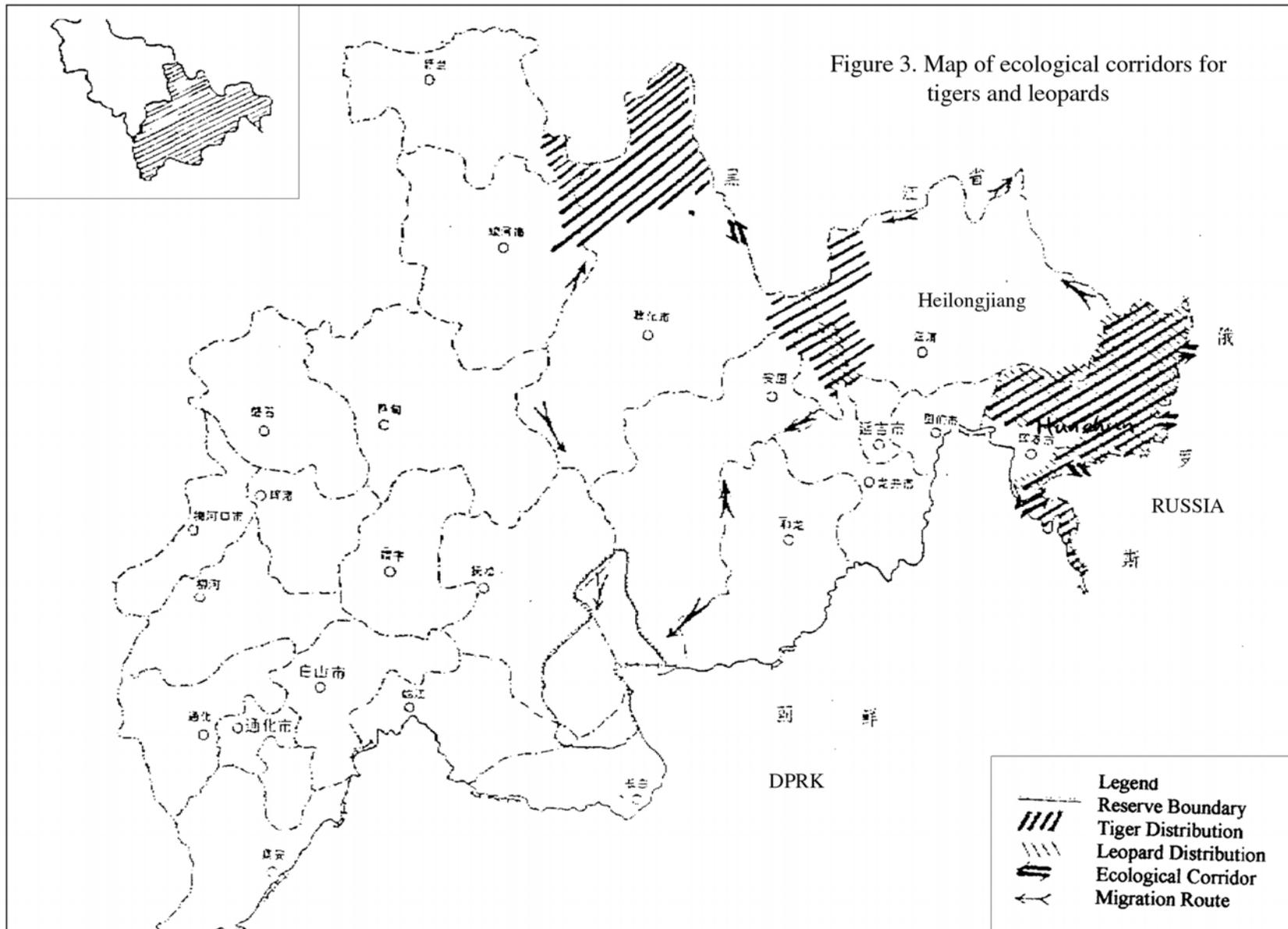


Figure 2. Map of Chinese-Russian International Tiger and Leopard Reserve in Jilin Province





# A SURVEY OF AMUR TIGERS AND FAR EASTERN LEOPARDS IN EASTERN HEILONGJIANG PROVINCE, CHINA 1999

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**Summary.** A survey of tigers and leopards was conducted in eastern Heilongjiang Province through questionnaires, interviews and field surveys in 1999. The results showed that distribution of tigers in Heilongjiang Province has obviously shrunk towards the boundary areas since the early 1990's. There has been no evidence of tigers for many years in the Western Wandashan and Northern Zhangguangcailing. 5-7 tigers occurred in eastern Heilongjiang in the 1999 winter, and most exist largely as nomadic and isolated individuals. Perhaps 3-5 Far Eastern leopards still occur in eastern Heilongjiang Province. We therefore conclude that the tiger and leopard is on the verge of extinction in Heilongjiang, and that emigration of individuals from Russia is the basis for these population groups. We consider that the extinction of tigers and leopards in Heilongjiang can only be averted if an immediate and long-term commitment is made to conservation of these two subspecies in the wild.

## 1. Introduction

The forests of Northeast China, Far East Russia and Korea hold two of the most magnificent mammalian carnivores on earth: the Amur or Siberian tiger (*Panthera tigris altaica*) and the Far Eastern leopard (*Panthera pardus orientalis*). Once dominant figures across the landscape, both species are now threatened with extinction. The tiger (*Panthera tigris*) is threatened across its entire range throughout Asia by a combination of poaching, habitat loss, and loss of prey. Because of its large area requirements, the tiger is particularly susceptible to habitat fragmentation and consequent loss of genetic diversity. The fact that this subspecies presently is distributed across three countries (Russia, China and possible North Korea) makes development of a comprehensive management plan that will prevent habitat loss and fragmentation particularly problematic.

The Far Eastern leopard is even more endangered than the tiger. Surviving only in a relatively small tract of forests along the Sino-Russian border. In total, their numbers have been consistently pegged at less than 40 individuals over the past 20 years.

Accurate information on the status of these species is a critical first step towards conservation planning that may mitigate the potential impact of development and loss of habitat. Russia conducted a range-wide survey of tigers in 1996 (Matyushkin et al. 1996) and has since conducted several leopard surveys (Pikunov et al. 1997, Aramilev et al. 1998). With support of the UNDP, Jilin Province conducted a survey on tigers and leopards in 1998 (Yang Shihe et al. 1998). A final component necessary to have a complete picture of tiger and leopard distribution at the end of the 20th century is this survey of eastern Heilongjiang Province, China.

## 2. Background Information

For detailed information, we refer readers to the report - "1999 Survey of Amur Tigers and Far Eastern Leopards in Eastern Heilongjiang Province, China and Recommendations for Their Conservation."

## 3. Study Area

This survey focused on the eastern mountainous area of Heilongjiang Province, China, including Laoyeling, Zhangguangcailing, and Wandashan forested regions. This area is geographically bounded between 128(24' and 134(05'E longitude, and 43(08' and 47(15'N latitude.

This region is bounded to the south by the provincial border with Jilin, and to the east by the international border with Russia.

#### 4. Methods

The methods include site visits and field survey routes. Please refer to the full report for survey methodology.

#### 5. Results

##### 5.1. Number of tigers

Based on the information gained from interviews and field surveys, we estimated that 5-7 tigers were present in eastern mountain areas of Heilongjiang Province in winter of 1998-1999. Details justifying this estimate are provided below and in Table 1.

Tiger #1. Jan. 19, 1999: One tiger track was identified on a survey route in Sanchahe Forest District Suiyang Forest Bureau. The front pad width averaged 10.0-11.0 cm, total track width measured 14.5 cm, and total length of track was 17 cm. Stride length averaged 75 cm (based on 5 measurements). The track was believed to be more than a week old. Also on Jan. 19, 1999, one tiger track was identified on a survey route in Nuanquanhe Forest District of Suiyang. The front pad width was 10.5-11.5 cm. The animal was likely a male. Although melt-out of tracks made precise measurements difficult, it appeared that the two tracks on two routes represented one individual on the basis of the front pad width, direction of travel, age of tracks, and distance between these two tracks (less than 10 km). It is likely the animal came from Jilin Province (as route 2 was directly on the border, and the animal was moving north), passed units 14, 12, 11, and 18 of Sanchahe forest sub-district, and likely traveled to unit 53 of Nuanquanhe Forest Subdistrict. This animal was likely a male.

Tiger #2. Jan. 24, 1999. A few white hairs which appeared to be those of a large cat were found on a tree that had characteristics of a "marking tree" (leaning birch tree positioned at an junction of trails) in Daimagou Forest District of Muling Forest Bureau. This sign possibly represented a sight where a tiger had rubbed on a tree, but it was not possible to verify observation.

Tiger #3. Oct. 20, 1999: One fresh tiger track was identified in Qiyuan Forest District of Dongfanghong Forest Bureau. The front pad width (FPW) averaged 9.5-10.0 cm, total width of track measured 14.6 cm, total length of track was 17 cm. Stride length averaged 70cm. It perhaps was a female.

Tiger #4~5. Oct. 21, 1999: A driver in Wulindong Forest District of Dongfanghong Forest Bureau spotted a tiger. The next day, a forestry officer found two tiger tracks, whose identification was confirmed by Yu Xiaochen in October 28, 1999 to be a female with one young. The front pad width (FPW) of the adult averaged 9.8 cm, and stride length averaged 80cm. The front pad width of the young averaged 8.0cm, stride length averaged 65cm. This adult was the same as tiger #3 on the basis of the front pad width, direction of travel, age of tracks, and distance between these two tracks.

Tiger #6. Nov. 5, 1999: A tiger track was found by Yu Xiaochen in Wupao forest district of Yingchun Forest Bureau. It appeared to be that of a female, with the front pad width (FPW) measured as 9.5-9.8 cm, total width of track was 15.0 cm, total track length was 17 cm, and stride length averaged 68 cm.

Nov. 7, 1999: A tiger track was identified by Yu Xiaochen in Qingshan Forest District of Dongfanghong Forest Bureau. It was same as that one in Wupao, the FPW was 9.6-9.8 cm, total track width was 16.5 cm, total track length was 17.5 cm, and stride length averaged 67.7cm.

Tiger #7. No evidence of tigers was found on survey routes in the southern Zhangguangcailing region, but interviewees reported one tiger in Dongjingcheng and Dahailin

Forest Bureaus of Southern Zhangguangcailing Mountains. Photographs of tracks were also taken. According to evidence provided by eyewitnesses, we believe this animal was likely a male.

From January 16 to Feb. 4, 1999, one tiger and multiple tracks were found in the Erzhusan (units 15, 11 and 52) and Beigou (unit 36) Districts of Dongjingcheng Forest Bureau and Qifeng (unit 119), Qianjin (unit 44) districts of Dahailin Forest Bureau. The tiger stayed in Erzhusan District for about 7 days, and stayed in Qifeng District for about 4 days, frightening local people and loggers, who refused to go into the forest. Local people drove the tiger away with firecrackers, after permission was received from appropriate authorities. Photographs of tiger tracks were taken. Based on timing, geographic locations, and general reports, we believe all these reports represent one animal, a male, that traveled through this region between 1998 and 1999.

Information from other interviews suggested additional tigers may exist in Northern Laoyeling, Muling Forest Bureau and Raohe County, but were not included in this estimate because sources were of unknown quality and unverifiable.

## 5.2. Distribution of tigers

Based on interviews and field surveys, the distribution of tigers in Heilongjiang Province has obviously shrunk since the 1980's. There has been no evidence for many years of tigers in the Western Wandashan and Northern Zhangguangcailing. We review evidence of tiger distribution within the other 4 regions defined in our survey (Figure 1).

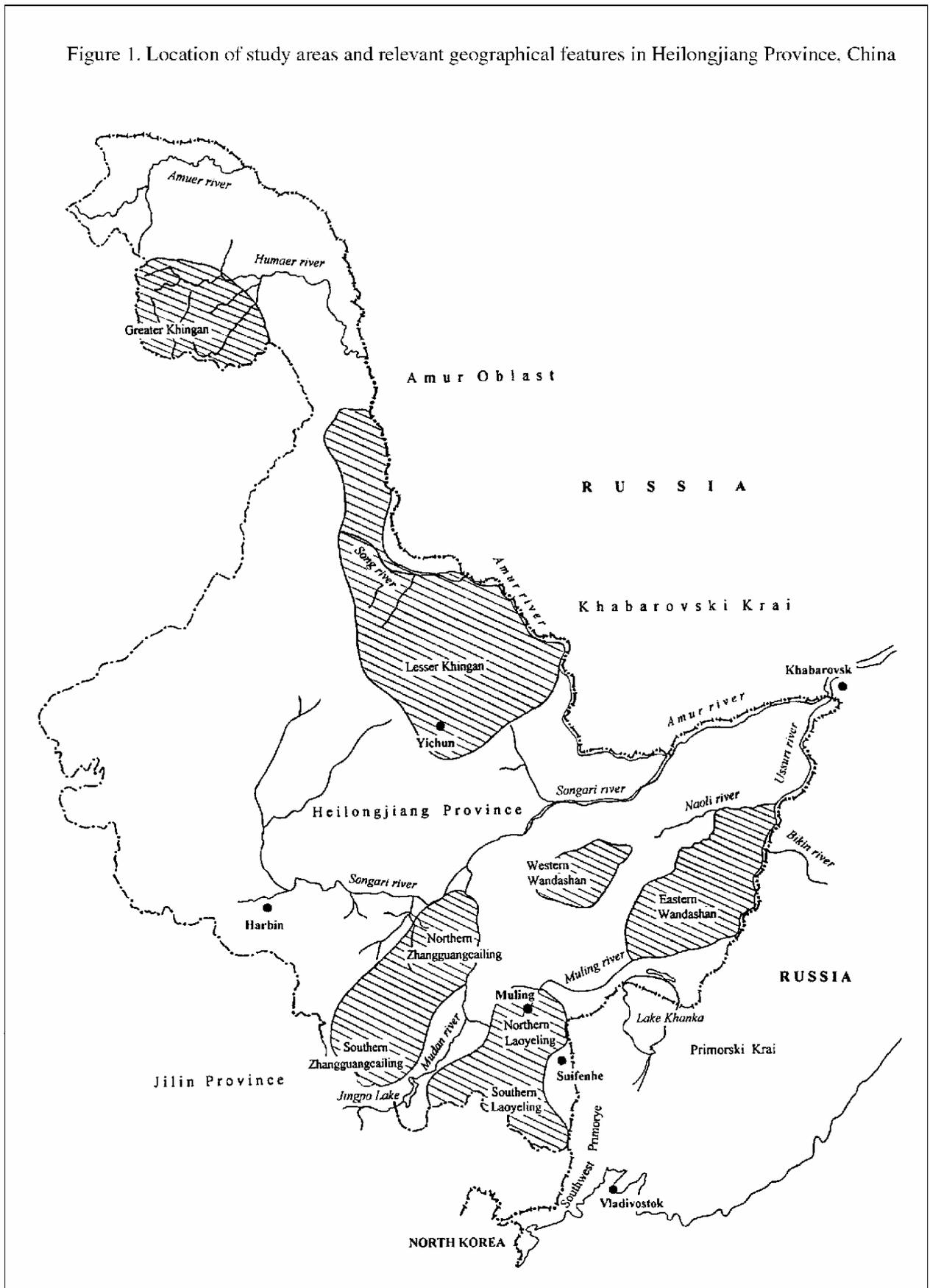
(1). Southern Laoyeling. Since 1994, 9 reports about tiger activity in this region were obtained via interviews, five of which were within the last two years (1997-1998). Two tracks and one potential rubbing on a tree were identified on the field survey routes. We estimate that at least 1-2 tigers were present in this region in the winter of 1998-1999. This region is contiguous with tiger range in Jilin Province and Southwest Primorye, Russia. Although high fencing on the Russian side of the border inhibits movements of animals, it is highly likely that tigers, leopards, and perhaps even ungulates, find crossover points that provide linkages for animal populations on both sides of the border. Southern Laoyeling was one of first regions developed by the forest industry (starting in 1948), and the most common forest types now are secondary broadleaf forests, but there still exist a few mixed Korean pine forests (conifer- broadleaf) in southern Suiyang. This region represents one of the best habitat patches for tigers in Heilongjiang Province because it abuts the Russian and Jilin borders, where tigers also occur (Matyushkin et al. 1996, Yang Shihe et al. 1998), has low levels of human activity, and relatively higher prey densities. There were an estimated 24 tigers recorded in this area during the 1974 survey, but only 3 tigers in 1991. Evidence of tiger still exists here, but a reduction in human disturbance, and protection of ungulates and habitat will be essential for recovery of the tiger population in Southern Laoyeling.

Nonetheless, this region represents one of two key areas for tiger conservation in Heilongjiang.

(2). Northern Laoyeling. Recent evidence of tigers in this region came only from one interview from December 1998. Although no evidence was found on the survey routes, heavy snowfall the day of the survey would have hidden potential sign. Prior to 1997, there had been repeated reports of tiger activity. Evidence of tigers was reported in adjacent Pogranichny Raion in Russia in 1996 (Matyushkin 1996), and although no evidence was found in a survey simultaneously conducted with this Heilongjiang survey in 1999 (Pikunov unpubl.), there was a report from a reliable source that a tiger had been poached from the Pogranichny area in the 1998-1999 winter. Tigers may still exist in this transboundary area, and it is a region that should be monitored for additional evidence.

(3). Southern Zhangguangcailing. Although no evidence was found along 8 survey routes, five interviewees reported sightings in January and February, 1999, and photographs of tracks confirmed the presence of a large felid. We believe these reports represent a single tiger that was present in the region during the 1998-1999 winter.

Figure 1. Location of study areas and relevant geographical features in Heilongjiang Province, China



This region is bounded on the south by Jilin Province, where reports of tiger activity occur infrequently (approximately every 2-3 years). Southern Zhangguangcailing apparently represents a region still accessible to dispersing tigers, but is not suitable for retaining a resident population. The higher elevation region has deeper snows, more intensive development, and more human disturbance, leading to lower ungulate densities and overall poorer habitat for large carnivores.

(4). Eastern Wandashan. Seventy-four percent of all interviews that indicated presence of tigers came from the Eastern Wandashan area. Although no evidence was found on any of the 31 survey routes, deep snows and the general problem of locating animals that exist at low density in large habitat patches may have resulted in the negative findings. Based on the number of relatively reliable interviews and later survey results by Chinese side in Oct.-Nov. 1999, we estimated that 3-4 tigers were distributed over Eastern Wandashan in 1999.

Although the total area of the Eastern Wandashan exceeds 19,000 km<sup>2</sup>, the most suitable habitat exists in about 2,000 km<sup>2</sup> of the central core of the range. Shendingfeng Peak appears to be the center of tiger activity, with tigers potentially using Qingshan, Qiyuan, Hekou, Shichang, Wulindong, Dumuhe, Yongxing, Dadai and Wupao Forest Districts, which surround Shendingfeng. The Naoli River represents the northern boundary of the region, and the Ussuri River is the eastern boundary. Northeastern Mishan County, a region of wetlands and croplands, appears to be a barrier separating the Eastern and Western Wandashan Mountains. The Chinese-Russian border is divided by the Ussuri River, but the river is frozen in winter and could be swum in summer by tigers. On the Russian side, the Strelnikov Range, connected to the Sikhote-Alin Range, could act as a movement corridor, and as a source for animals emigrating into eastern Wandashan from Russia. On the Chinese side, the regions from Zhenjiang to Yongxing and from Xinancha to Dadai could also possibly act as ecological corridors for tigers.

At present, prey resources and forest habitats are in better condition here than elsewhere in eastern Heilongjiang, but high road densities, intensive logging, high hunting pressure and serious human disturbance all threaten this region. Despite these threats, the Wandashan represents the best potential tiger habitat in eastern Heilongjiang, and with Southern Laoyeling, has the greatest potential to act as a reserve for tigers in Heilongjiang Province. Most importantly, this is the only region in all of northern China (Jilin and Heilongjiang) where there appears to be any evidence of a female tiger reproducing. Since 1995, family groups have been reported 4 times. Reproduction is obviously critical if a population is to survive and increase, and the Wandashan appears to be the single area where it may be occurring. Protection of tiger habitat should be a priority for this region.

### **5.3. Number of leopards**

Based on the information gained from interviews, we estimated that perhaps 3-5 leopards have been present within the survey area in eastern Heilongjiang during the 1998-1999 winter based on the information summarized here and in Table 2.

Leopard #1. Based on interviews, we estimated that one leopard was possibly present in the southern part of Suiyang Forest Bureau of Southern Laoyeling. There exists suitable habitat for leopards in Sanjielazi, Liumaogou, Hancongou, Sanchahe and Nuanquanhe districts of southern Suiyang Forest Bureau, which is contiguous to leopard habitat in Southwest Primorye, Russia.

Leopard #2. Based on interviews, it is possible that at least one leopard was present in Muling Forest District of Southern Laoyeling in the 1998-1999 winter.

Leopard #3. According to interviews, it is likely that that at least one leopard was present in Shuangqiaozi and Laoheishan districts of Northern Laoyeling (northern Suiyang Forest Bureau) in the 1998-1999 winter.

Leopard #4. Based on interviews, it is possible that one leopard was present in Dahailin Forest Bureau of Southern Zhangguangcailing.

Leopard #5. One leopard may have been present in Lingkou Forest Bureau of Northern Zhangguangcailing in 1998-1999 winter, based on interviews.

## 5.4. Distribution of leopards

Based on field surveys and interviews, we review the status of 4 study regions as potential leopard habitat (Figure 1). We do not include Eastern Wandashan, which likely has never had a leopard population in the past 100 years, and is not considered suitable habitat for leopards.

(1). *Southern Laoyeling*. A total of 10 interviews (56% of total) suggest that this region may be the most important for leopards. Southern Suiyang has the most suitable habitat for leopards, and is immediately adjacent to Borisovkoe Plateau Zakaznik (wildlife refuge) in southwest Primorye Krai, Russia, which is considered prime leopard habitat, and has been one of the key areas in Russia protecting leopards. Southern Suiyang Forest Bureau, in combination with potentially good habitat in Hunchun County in Jilin Province (which also borders leopard habitat in Russia), must be considered vital habitat for the Far Eastern leopard. It will be critical to protect prey resources and habitat in this region, and to insure connectivity exists between suitable habitat in Southern Laoyeling, Heilongjiang, Hunchun, Jilin, and southwest Primorye Krai.

(2). *Northern Laoyeling*. Three interviews (17% of total), including what appears to be a visual observation, suggested that leopards still occur in Northern Laoyeling close to the Russian border. In the past five years, a number of tracks have been reported. A simultaneous survey in Pogranichny Raion, Primorye (opposite Northern Laoyeling) failed to provide evidence of leopards this winter, although leopards have been reported here in the 1990's. There is relatively little suitable habitat (even including Pogranichny Raion in Russia). Survival of leopards (and tigers) will depend on providing corridors to other habitat patches in the region.

(3). *Southern Zhangguangcailing*. Only 2 interviews (11% of total) suggest that leopards may be present in this region. There are some secluded areas in Southern Zhangguangcailing that could harbor leopards, but anthropogenic disturbances, including intensive logging, heavy snaring, and lower prey densities make this region relatively poor habitat for leopards.

(4). *Northern Zhangguangcailing*. Although no survey routes were covered here, there were 3 reports of leopards in the region. However, no evidence of leopards was found on 36 routes during a wildlife resource census (March to April 1999). In general, probably neither interview nor survey data is reliable because survey personnel (and interviewees) had no training and little experience identifying large carnivore tracks.

## 5.5. Distribution and Abundance of Prey Species

### 5.5.1. Ungulate prey species

As part of our effort to assess the potential of survey areas to support tigers and leopards, we reported sign of large ungulate species along survey routes. Roe deer were the most common large ungulate in eastern Heilongjiang, but wild boar and red deer were encountered in all regions. Evidence of sika deer was found only in Southern Laoyeling. *Roe deer (Capreolus capreolus)*. Roe deer was the most common ungulate species in all study regions in eastern Heilongjiang, with tracks present on 80% of the survey routes. We estimated that approximately 456 animals crossed survey routes, leaving 879 tracks. All measures of abundance indicated that roe deer were the most common ungulate in all areas. Greatest abundance appeared to be in the Eastern Wandashan, and lowest abundance in Northern Laoyeling. Relative abundance of roe deer in the Southern Laoyeling and Southern Zhangguangcailing were similar.

Despite the fact that numbers of roe deer were higher than other ungulates, densities still appeared lower than the potential of the habitat to support this species. The roe deer population could likely increase substantially across much of the area surveyed if better protection were provided. As with other ungulate species, human harvest is likely the key limiting factor.

Although tigers prey on roe deer, they are usually a secondary component of the tigers' diet. It is unlikely that a tiger population could survive and reproduce in an area where only roe deer occurred. However, roe deer can be an important component of the diet of leopards and a supplemental component of the diet of tigers. Although important to both carnivore species, increased populations of wild boar and red deer are likely more important for tigers.

*Wild boar (Sus scrofa)*. Wild boar was found in all regions where survey routes were covered (Southern and Northern Laoyeling, Southern Zhangguangcailing, and Eastern Wandashan). As is typical of this species, distribution was sporadic: tracks were found on only 26 of the 67 routes (39%). We estimated there were about 158 animals on the survey routes, based on the 207 tracks recorded. Overall abundance of wild boar was low, but highest in Southern Zhangguangcailing. Local experts believe that the wild boar populations are increasing due to the newly enforced ban on hunting, but nonetheless, illegal hunting is still common (see Section 5) and likely the primary cause of wild boar mortality. This species, where present, forms a key component of the diet of tigers. Therefore, any plan for tiger conservation must include an adequate plan for increasing wild boar in recovery zones.

*Red deer (Cervus elaphus)*. Red deer were uncommon across all survey regions. No evidence of red deer was found in Northern Laoyeling, but only 4 survey routes were covered there, and fresh snow reduced the potential to assess abundance of ungulates in general in this region. This species was found on only 28.4% (19 routes) of routes surveyed. Highest densities of red deer tracks were found in the Eastern Wandashan region, and in general this region appeared to be better habitat for red deer. Evidence of red deer was rare in Southern Zhangguangcailing and Southern Laoyeling, which concurs with the fact that this species is also rare in neighboring regions of Jilin Province and Russia.

*Sika deer (Cervus elaphus)*. Evidence of sika deer was found in a very small sliver of habitat in the most southern part of Southern Laoyeling in the Sanchahe and Nuanquanhe Districts of Suiyang Forest Bureau. Tracks were found on only 2 routes (3% of total routes). Sika deer often have a localized and clumped distribution, as was demonstrated here: on one route 43 tracks were recorded.

### 5.5.2. Secondary prey species

In addition to ungulates, other animals are preyed upon by tigers and leopards. Leopards especially rely on a variety of smaller mammals and birds; tigers also take small items, and sometimes prey on bears as well. When ungulate densities are low, as is the case in Heilongjiang, the importance of secondary species becomes magnified. Therefore, the status of these potential preys is reviewed here.

*Hares (Lepus spp.)*. Two species of hares, the Manchurian and arctic, occur in the eastern mountains of Heilongjiang Province. However, we could not distinguish between the two species based on tracks and scats. In general, Manchurian hare are more widely distributed, and arctic hare are found only in the Wandashan Mountains. Sign of hares (either scat or tracks) was found on 60% of the survey routes. In the Eastern Wandashan, hares were especially abundance, being found on 81% of survey routes. Nonetheless, hare numbers were generally low throughout the survey region. Although hare numbers fluctuate widely naturally, intensive snaring no doubt is depressing numbers in at least some regions. At present, hare numbers are so low that they do not contribute significantly to the available prey biomass.

*Bears (Ursidae)*. Both brown bears and black bears occur in eastern Heilongjiang Province. Bears can form a small, but significant part of the diet of tigers. Although most bears should have been hibernating at the time of the survey, tracks were nonetheless found on 5 routes (4 appeared to be black bears, and one a brown bear), and evidence of tree breakage by black bears (to harvest mast and berries) was found on 7 routes (16%). Evidence of Himalayan black bears was found in all regions except Southern Zhangguangcailing. Although data is inadequate, available evidence suggested that bears were widely distributed but relatively rare in the areas surveyed. In addition to

the species discussed above, 2 species of gallinaceous birds can act as a forage resource, especially for leopards. The hazel grouse and pheasant were distributed across many parts of the survey area, but hazel grouse were by far more common. Evidence of hazel grouse was observed on over half of the survey routes, and it was broadly distributed across the region. No evidence of pheasant was encountered along survey routes.

## **5.6. Factors Influencing Prey Populations**

The sporadic distribution and low abundance of many prey species in survey areas was likely attributable to two factors - excessive human harvest and reduction of suitable habitat.

### ***5.6.1. Reduction of suitable habitat***

Every wildlife species requires a set of habitat parameters that provide forage, cover, and other critical needs. The amount of suitable habitat for many wildlife species has decreased in Eastern Heilongjiang due to continuous, long-term logging activities. Of the key prey species for tigers, wild boar are probably most dependent on Korean pine forests. Because Korean pine nuts are an important winter forage, loss of this habitat type can have a dramatic impact on the potential of an area to support wild boar. While red deer can survive in second-growth forests, such forests are often of marginal value for wild boar unless adequate mast crops exist -the most important of which, in addition to Korean pine, are Mongolian oak and hazelnut (*Corylus* spp.). Mongolian oak is a common component of second growth forests of this region, but in recent years the cultivation of an edible fungus (*Auricularia auricula-judae*) has resulted in the loss of large areas of oak forests. Any further increases in these economic developments will have serious impacts on the distribution and numbers of wild boar distribution.

The Project for Protection of Natural Forests, which was initiated by the Federal government, should protect vast forest tracts of Heilongjiang Province. This project could greatly benefit wildlife by protecting habitat and reducing human activity (especially illegal hunting) on forest lands. This project also has important implications for creation of protected areas.

### ***5.6.2. Excessive human harvest***

Although possession of hunting firearms is illegal, it is clear that some hunters are still in possession of rifles, and make use of them. For instance, we encountered 6 hunters with one gun and 3 dogs (useful for hunting wild boar, squirrels and other species) in Shichang District of Dongfanghong Forest Bureau, Eastern Wandashan.

While hunting by rifle still occurs in the region, snares no doubt have a greater impact in the region. A total of 78 wire neck snares, apparently set primarily for capture of ungulates, were found along the 566 km of survey routes that were covered on foot. We found 10 instances where evidence suggested that ungulates had been killed (dead animals in snares, remains at snare site, tracks in snow where animals had been dragged off, etc.); including 3 instances where the remains of an ungulate was found in a snare. Snares appeared to be of varying ages - some appeared to have been set many years ago, but most were probably set this winter. Old snares, though no longer maintained or checked by trappers, continued to function, killing ungulates.

Snares not only kill ungulates, but also have the capacity to kill large predators such as leopards and tigers. Information from two interviews indicate that at least two tigers were snared since 1995, and at least one of those was killed in a snare set for wild boar in Wupao District of the Eastern Wandashan. Our ability to collect such information was limited, and it is likely that other incidences went unreported.

These data strongly suggest that the widespread prevalence of snares is the most likely explanation for the paucity of prey over the survey area. The scarcity of tigers, leopards, and lynx,

and the absence of wolves or other large predators suggests that predators are not depressing prey populations. Good habitat and adequate forage exists for roe deer, red deer and wild boar. These species can recover naturally in most areas if snares are eliminated, and the intense harvest pressure by humans is reduced.

## 6. Conservation Strategy and Management Recommendations

The tiger has become extremely endangered in Heilongjiang China. In fact, in combination with survey results in eastern Jilin Province (Yang Shihe 1998), we conclude that the tiger is on the verge of extinction in northeast China. The animals that do occur across this region appear to be for the most part, isolated, nomadic individuals. With the possible exception of the Eastern Wandashan, there is no evidence that tigers are reproducing anywhere in northeastern China. Given the fact that reproduction is not occurring, it appears that those animals that do occur in Jilin Province, and in Laoyeling and Zhangguangcailing of Heilongjiang, are probably dispersing nomads that have crossed the border from Russia. The existing situation suggests that, again with the possible exception of the Wandashan region (although exchange occurs there as well), the presence of tigers in northeast China is completely dependent on the fact that dispersal of tigers from Russia is still possible. Therefore, those populations of tigers that still exist on the Russian side of the border are critical to survival and recovery of tigers in both Jilin and Heilongjiang. Without reproduction, and without any localized concentration of tigers where reproduction could occur, tigers in northeast China would likely already be extinct if emigration from Russia were not occurring.

Leopards are probably even rarer than tigers in Heilongjiang. Leopards were probably historically found only in southeast Heilongjiang in Laoyeling and possibly Zhangguangcailing regions. Most of Heilongjiang probably represents marginal leopard habitat, and leopards were probably always rare. Nonetheless, there likely existed a few pockets of good leopard habitat where they were not uncommon in both southern and northern Laoyeling, and perhaps in the southern Zhangguangcailing region. Although the Chinese government has taken steps to protect wild tigers and leopards, these steps do not appear to have improved the status of either species in Heilongjiang. We consider that habitat loss and fragmentation as well low prey densities was the primary threats to these populations.

Despite the dangerously low populations of tigers, leopards, and their prey, there are at least six reasons for optimism that these populations can recover in Heilongjiang Province. 1) There remain extensive tracts of forested lands in Dongfanghong, Yingchun, Suiyang, Muling, Dongjingcheng and Dahailin Forest Bureaus, and although prey populations are low, these regions retain the capacity to harbor good populations of prey, as well as tigers and leopards, if they are adequately protected. 2) There exist sizable populations of tigers, leopards, and their prey in adjacent habitat in Russia that could act as a source for animals emigrating into Laoyeling and eastern Wandashan of Heilongjiang Province, thus speeding the recovery process. 3) Although China has a very large human population to care for, human densities adjacent to potential tiger and leopard habitat are not high, and in fact are comparable to regions in nearby Russia that harbor healthy populations of tigers and leopards. 4) Evidence of reproduction by at least one female was found in the vicinity of Shendingfeng Mountain in Eastern Wandashan in recent years, indicating that breeding and natural reproduction (and hence, the potential for population increase) can still occur. 5) Enactment of the Project for Protection of Natural Forests in 1997 can assist in protecting large tracts of habitat necessary for conservation of tigers and leopards. 6) Finally, there appears to be a sincere desire on the part of the Wildlife Animal Protection Society and the Ministry of Forestry, as well as other branches of the government, to assist in recovery of tiger and leopard populations. The Ministry of Forestry is presently developing "The Tiger Conservation Action Plan for China and the Russian and Chinese federal governments have initiated dialogue for establishment of transboundary reserves to protect Amur tigers.

If the forests are properly protected, illegal hunting and snaring is controlled, and ungulate populations are allowed to increase, resident populations of tigers and leopards will naturally become established in Heilongjiang Province. We recommend that the goal of a recovery process of tigers and leopards in Heilongjiang should be the establishment of a viable, resident breeding population of wild tigers and leopards. We present nine recommendations concerning land use practices and recovery of ungulate populations in Heilongjiang Province that we believe would lead to the recovery of tigers and leopards.

- (1) Develop a tiger and leopard recovery plan for Heilongjiang Province.
- (2) Development of specially protected areas (national and international), Tiger Management Areas, and Ecological Corridors in Southern and Northern Laoyeling Regions.
- (3) Development of a specially protected area (national and international), Tiger Management Areas, and an ecological corridor to nearby Russian tiger habitat in the Eastern Wandashan Mountains.
- (4) Control illegal hunting
- (5) Develop a monitoring program for tigers, leopards, and their prey, and develop cooperative cross-border surveys.
- (6) Control logging of Korea Pine forests and protect habitat.
- (7) Enhance international cooperation and information exchange.
- (8) Develop an environmental education program for villages close to tiger and leopard management areas.
- (9) Develop a state-sponsored compensation program for tiger or leopard depredations on all livestock.

For detailed information read the report - "1999 Survey of Amur Tigers and Far Eastern Leopards in Eastern Heilongjiang Province, China and Recommendations for Their Conservation."

Table 1. Evidence used for estimating number of tigers in eastern Heilongjiang Province, China, winter 1999.

No.	Tiger Region	Forest District	Date of information	Tracks			Scent-mark	Age of evidence	Interview #	Key information	Quality of information	Sex	Estimated # tigers
				Front Pad width (cm)	Total width x length (cm)	Stride length (cm)							
1	Southern Laoyeling	Suiyang	19.01.99	10.0-11.5	14.5	75 (n=5)		> 7 days		tracks on 2 routes	good	male	1
2	Southern Laoyeling	Muling	19.01.99				hair on tree	?		marginal evidence on route 17	unconfirmed		0-1
3	Southern Zhangghangcailing	Dongjingcheng							64-68	photos of tracks	good	male	1
4	Eastern Wandashan	Dongfanghong	20.10.98	9.5-10.0	14.6x17.0	70 (n=3)		1 day	3-4, 7-10, 23, 38	maybe same as 5	good	female	0-1
5	Eastern Wandashan	Dongfanghong	22.10.98	9.8		80 (n=3)		visual	53	a driver saw tigers #5 & #6 together on road	good	female	1
6	Eastern Wandashan	Dongfanghong	22.10.98	8		65 (n=2)		visual	53	a driver saw tigers 5 & 6 together on road	good	young with # 5	1
7	Eastern Wandashan	Dongfanghong	05.11.98 07.11.98	9.5-9.8	15x17 16.5x17.5	68 (n=8) 67.7 (n=11)	hair on tree	3-5 days	16, 48, 49		good	female	1
Total												5-7	

Table 2. Evidence used for estimating number of leopards, based interviews of local people in eastern Heilongjiang Province, China, winter 1999.

No.	Location Region	Forest district	Interview #	Quality of information	Estimated # of leopards
1	Southern Laoyeling	Sanchahe, Hanconghe, Suiyang	11, 12, 13	unconfirmed	0--1
2	Southern Laoyeling	Muling	2, 3, 4	good	1
3	Northern Laoyeling	Shuangqiao, Laoheishan	1, 5, 8	good	1
4	Southern Zhangguangcailing	Changting, Dahailin	9	unconfirmed	0--1
5	Northern Zhangguangcailing	Shidao, Fendou, Chaoyang, Lingkou	6, 7, 10	good	1
Total					3--5

## **STATUS OF THE AMUR TIGER AND THE FAR EASTERN LEOPARD IN THE RUSSIAN FAR EAST**

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In Russia, the Amur tiger lives in the southern portion of the Far East, in the most developed and most densely settled portion of the region. Less than one-third of the tiger's habitat was located in the Russian Far East in the 19<sup>th</sup> century, and most of the tiger's natural habitat was located in northeastern China and on the Korean peninsula. Today, the situation has changed and more than 95% of the Amur tiger's remaining habitat is in Russia. For that reason, Russia has a moral responsibility to protect this unique predator.

The tiger was a common commercial species in the south of the Russian Far East in the early 20<sup>th</sup> century. Reports from the literature indicate that 120-150 tigers were killed annually. Intentional extermination of these predators, accompanied by the simultaneous reduction of its habitat resulting from continuous industrial and agricultural development of the territory, resulted in a dramatic drop in tiger numbers in the beginning of the 20<sup>th</sup> century. By the end of the 1930's, the tiger was on the verge of extinction and only twenty to thirty individuals remained in the wild (Kaplanov, 1948). The heroic efforts of enthusiasts, zoologists and wildlife biologists led to a ban on tiger hunting in 1947. Between 1956-1960, an initial partial ban on capturing tiger cubs was followed by a full ban. By the early 1970's, the population had rebounded to around 150 individuals. By the early 1980's, tiger numbers were estimated at 180-200, and by the mid 1980's, 240-250 individuals (Yudakov et al., 1972; Pikunov et al., 1983). The latest tiger census, conducted in 1995-1996, set the wild tiger population at between 415-476 individuals (Matyushkin et al., 1996).

Despite increasing tiger numbers (which some specialists believe continued until the mid 1990's), conditions in the Russian Far East are deteriorating. Almost 90% of the tiger's habitat have undergone intensive, commercial timber harvest. And the harvest of some species, notably oak and Korean pine, has seriously degraded the value of these forests for the ungulates that live there, and accordingly, for large predators.

It is obvious that the growth in tiger numbers between 1950 and 1990 was in part the result of a reduction in poaching. Beginning in 1990-1991, demand for tiger products, primarily tiger bone, reappeared, in part a direct consequence of the opening of Vladivostok and Primorskii Krai to foreigners. Our estimates show that, beginning in 1991, at least 50 tigers were, on average, annually poached for export. If one accounts for natural tiger deaths - ten percent of the entire population - the total number of annual tiger deaths reached 60-80 individuals, a figure that most likely exceeds the population's reproductive capacity.

There is a clear tendency toward habitat fragmentation throughout the Sikhote-Alin. The tiger now occupies almost all suitable forest habitats in the region. Three distinct populations of Amur tigers have been identified in the Russian: 1) a primary group in the Sikhote-Alin Mountains; 2) a second group in southwest Primorye, including Pogradichny Raion, where tigers have contact with northeastern China and migrate to Jilin and southern Heilongjiang Provinces, and possibly retain contact with habitat in the People's Democratic Republic of Korea; 3) a third group along the Strelnikov Ridge in Pozharskii Raion of Primorskii Krai that connects the main tiger population in the Sikhote-Alin mountains with tigers in Wandashan, China (Figure 1).

Based on censuses in the winters of 1995-1996 and 1999-2000, the number of tigers in southwestern portion of their Russian habitat is less than nine to ten tigers. The number of Far Eastern leopards counted in this same area ranges from 23-27 (Matyushkin et al. 1996; Pikunov et al. unpublished).

The winter census of 1995-1996 indicated that there are only four tigers in Pogradichny Raion. A 1999-2000 census found no tiger tracks at all. With no verifiable data, it is not know if the tigers have migrated to Heilongjiang Province or if poachers have killed these tigers.

The 1995-1996 census revealed two or three tigers in the Strelnikov Ridge of Pozharskii Raion. A winter 1999 census found no tiger tracks (Matyushkin et al. 1996; Dunishenko unpublished).

It is increasingly more obvious that the tiger population in the Russian Far East is facing adverse conditions. It is my opinion that this is occurring for the following reasons:

1. Habitat quality is deteriorating, with an increase in disturbance and a reduction in prey densities. There are 77,000 ungulates - wild boar, Manchurian red deer, sika deer, roe deer - in Primorskii Krai, according to regional Wildlife Department data on ungulates outside of protected territories. Between 250-280 adult tigers live outside of protected territories. Between 30-50 tigers, at a minimum, live within protected territories. Thus, in the best of the unprotected habitat, for each adult tiger or family of predators, there are 250-300 ungulates. This is the absolute minimum allowable to assure normal living conditions for an adult tiger in a context of the demands placed upon ungulates for commercial hunting purposes. Predator tracks were encountered in our fieldwork only in those areas where there was an adequately high density of wild ungulates. We will be unable to preserve tigers on protected territories that account for only 5% of the tiger's habitat. Normal food chain conditions must be created for the predator within areas where commercial hunting of ungulates is currently allowed. Perhaps this will require a temporary ban on hunting ungulates and creation of new protected territories. This is the most important factor limiting the growth of tiger numbers in the Russian Far East.

2. Dramatic increase in the number of tigers in protected territories and in the areas adjacent to them. An analogous situation was observed in the past, but to a significantly lesser degree.

3. Reduction in the habitat quality in the middle and lower drainages of rivers is forcing tigers to shift to the upper reaches of river drainages and to the north of the Sikhote-Alin, that is, to adapt to more extreme conditions.

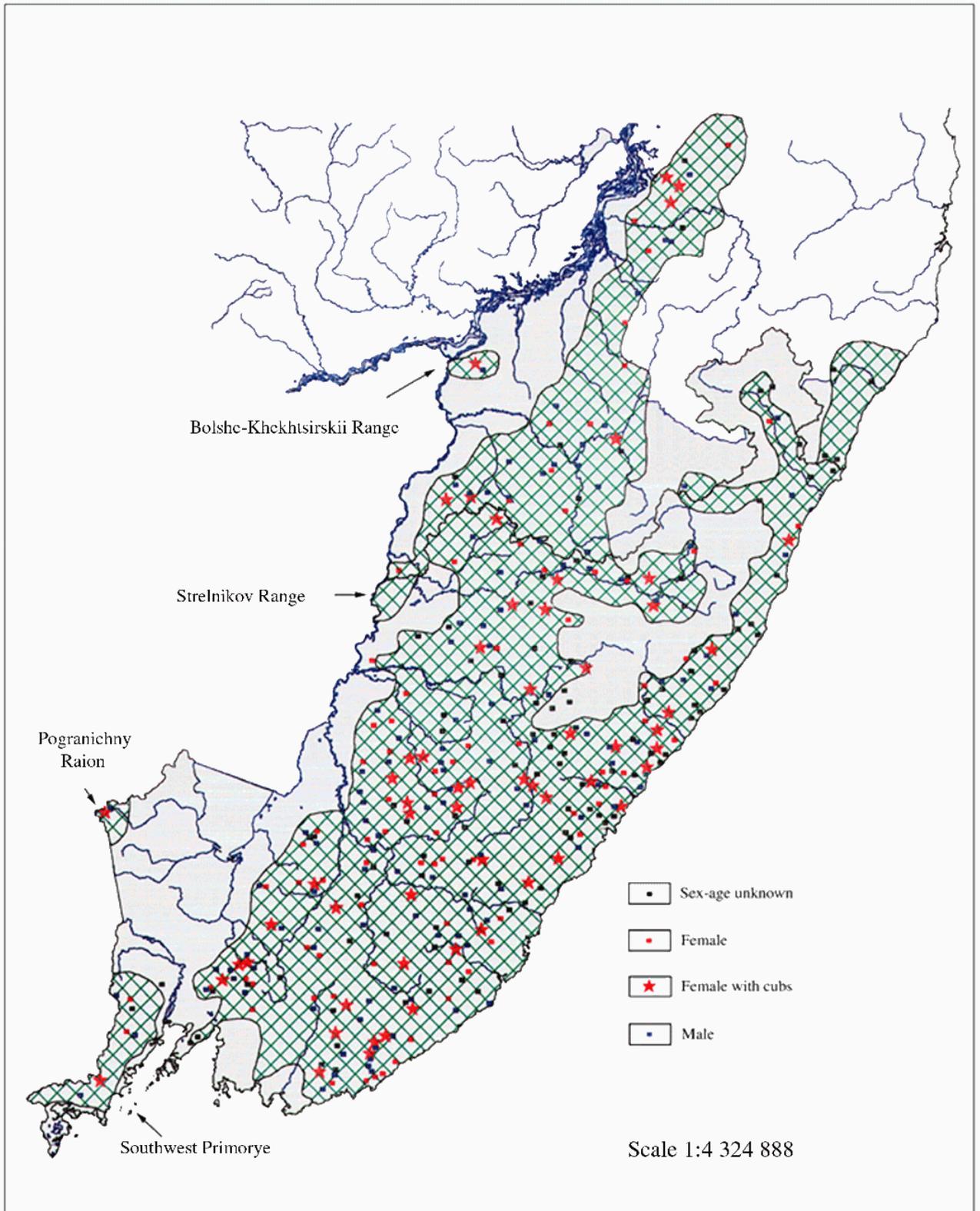
4. Decrease in the quantity and size of tiger and leopard litters.

Monitoring results from the last three years indicate that, for the time being, the status of the tiger population is stable. However, the reasons stated above underscore that the population of tigers, and even more so, of leopards, are at the limit of their reproductive capacity and if, in the near future, the situation does not change, (and most importantly, if there is not an increase in ungulate numbers), then the population of these unique predators, will most likely decline or disappear from less favorable regions. It is our opinion that the small subpopulations of tigers located on the Russian side of the border that come into contact with tigers in People's Republic of China are in an especially difficult situation, given the highly developed and heavily settled character of their habitats. It is here that there is a need to immediately create protected territories that will act as environmental corridors for migration of large predators and ungulates between the People's Republic of China and the Russian Federation.

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Figure 1. Distribution of tigers in the Russian Far East and 4 locations where tiger occur along the international boundary with China (reproduced from Matyushkin et al., 1996)



## OVERVIEW OF THREATS TO NORTHEAST CHINA TIGERS

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### Introduction

I want to thank Heilongjiang Forestry Department and Heilongjiang Wildlife Institute for organizing this workshop, and I want to thank the US. Fish and Wildlife Service's Rhinoceros Tiger Conservation Fund, and in particular Fred Bagley, for providing support for this workshop. And of course, Endi Zhang, of WCS, has been instrumental in coordinating this process.

We are many people brought together from many countries with a single concern – the survival of tigers and leopards in the forestlands of northeast China. Unlike all of us, neither tigers nor leopards carry passports or visas – a tiger that is one day in Russia, can be found in China on the next, and even appear in Korea on the next day. If we are to save tigers, therefore, it is necessary for people from many countries to work together. I firmly believe that the future of tigers in northeast China is closely linked to the future of tigers in Russia, and in Korea. Therefore, although the process that brings us together is largely the responsibility of the Chinese people – of the Chinese specialists gathered here today in this room – if the Chinese people decide that they want to save tigers in northeast China, it will require a cooperative effort. We are here, therefore, to assist you in your efforts to save tigers. But we will be looking to our Chinese colleagues to take the lead in this effort.

Although tigers still occur in Northeast China, the presentations in this section demonstrate that the north China tiger is on the verge of extinction, and in fact, without emigration from Russia, the tiger may already have gone extinct in Jilin and Heilongjiang. I would like to propose that there is one goal that has brought us together, and that it should be the guiding theme for our work over the next 3 days. That is, our goal should be to secure a viable wild population of tigers in North China. And I propose that we should hold onto that single goal as a guiding force that directs our discussions – that we put aside personal or professional ambitions to focus on this single theme – what needs to be done to insure that a viable population of wild tigers will be left here in Heilongjiang and Jilin for our children, and our children's children.

The following is a quote from the 1999 report on the survey of tigers and leopards in Heilongjiang Province:

“We cannot overemphasize the urgent need to develop and implement a recovery plan immediately: while tigers still exist in Wandashan, and are scattered across Laoyeling and Zhangguangcailing [and Hunchun region of Jilin], it is important to implement plans that can save the remaining tigers. Attempts to recreate a population after tigers become extinct in northeast China will be more difficult by several orders of magnitude. Therefore, it is essential to create and implement a recovery plan immediately.”

This, in essence, is our task for the next 3 days – to develop a program for tiger conservation – what are the problems, what needs to be done, and who needs to do it. We will present ideas, debate, maybe heatedly argue – and hopefully come to a consensus in developing a first draft document on what might be called “a blueprint for tiger conservation in northeast China”.

### Threats to Tigers in Northeast China

To know what needs to be done, we must first know what threats exist, and I propose that the following conditions are key threats to tiger survival in northeast China:

1. **Habitat loss, degradation, and fragmentation.** Although forests still exist across much of Heilongjiang, they are very different from the forests that were here 100 years ago, and they are fragmented into small parcels. Tigers need large forest units, and there must be actions taken to protect forests and insure connectivity between forest patches.

2. **Low prey densities.** Healthy, large tracts of forests will still be empty of tigers and leopards if there is nothing there to eat. Based on surveys in both provinces, it is clear that there remain some places where the key prey species of tigers can be found – red deer, wild boar, sika deer – but there are many other places that are empty. If there are to be tigers, then these ungulate species must be present in healthy densities.
3. **Direct human-caused mortality of tigers.** We know very well that in Russia, there are many tigers killed every year (see Pikunov report in this section). There is no reason to believe that the same is not true here in China. Few people talk about this issue in China, but we, within this room, need to talk about this topic in the next few days – about how we can reduce the amount of poaching.
4. **Tumen River Development Plans.** I don't want to suggest that large development plans are all bad, but they can pose threats to tigers and leopards if they are not carefully developed. The development corridor proposed between China, Korea, and Russia is likely to create a barrier to movement of tigers and leopards, and to eliminate habitat. The zone of influence of this development project overlaps precisely with the last remaining population of Far Eastern leopards. We must work together closely to insure that development proceeds in concert with the needs of such endangered species.

## Protecting Tiger Habitat

I want to return to the topic of protecting tiger habitat, because I see it as the core issue for tiger conservation in Northeast China, and the single topic that many sessions will revolve around. There are several key points that must be made in relation to this issue in Northeast China, namely:

1. **We cannot overemphasize the fact that the problem in Northeast China is not lack of tigers, but lack of adequate tiger habitat.** There would be more tigers in Northeast China if there were more suitable habitat, but in fact, suitable habitat is very limited. This fact leads to the next important point I want to make, which is:
2. **Reintroduction of captive tigers will not solve the problem, but only exacerbate it.** Many people think that if there are few tigers, the simple answer is to put more tigers into the forest with a reintroduction program. But that is a fundamental misunderstanding of the problem. Even ignoring the myriad problems that would be faced by an attempted reintroduction program, the fact remains that without adequate habitat, it doesn't matter how many tigers are reintroduced to the forest – they will not survive.
3. **If adequate habitat is protected, there is no need to introduce tigers from captivity** – they will re-establish themselves naturally. Good evidence exists from our surveys in Jilin and Heilongjiang, as well as monitoring being conducted by Xiaochen Yu in Heilongjiang (see Session 6), that tigers do move back and forth across the international border. If good habitat is protected, and prey populations are allowed to rebound in northeast China, tigers crossing the border will find good habitat, and will settle in these regions. Thus, there is no need to initiate a reintroduction program with captive animals.
4. This line of thought leads to the next logical question, which is, “**What is good tiger habitat?**” I propose that good tiger habitat is:
  1. Large tracts of forested areas linked together;
  2. Forested areas with high prey densities (red deer, wild boar, sika deer);
  3. Forested areas with reduced human activity with:
    - a) restrictions on hunting;
    - b) restrictions on logging; and,
    - c) restrictions on road access.

These are the key components of tiger habitat, and any conservation plan to recovery tigers in northeast China must address each of these issues.

## **SESSION 2. LAND USE PLANS: PROTECTED AREAS, ECOLOGICAL CORRIDORS, AND PRIORITY MANAGEMENT AREAS**

### **Introduction to Session 2.**

A core component of any action plan aimed at protecting tigers must include a provision for the creation of protected areas, where tigers and their prey can live in a secure landscape, free of the pressures of humans. It has been repeatedly demonstrated around the world that the key to long-term survival of large carnivores, like the tiger, is a network of highly protected lands that provide a high degree of security. Because the needs and demands that people make on the landscape is often very different from the needs of large carnivores, these reservoirs are essential to maintaining a safe haven where large predators can live their lives in the absence of persecution by humans. These protected areas should also provide a haven for prey species, and it is usually the case that, if an area is well protected, prey densities are consistently higher inside versus outside the protected areas. High prey densities are critical not only for survival of tigers, but also for reproduction. A tigress with young has great energy demands, and there must be a secure and constant supply of prey if she is to successfully raise young. Therefore, one of the key functions of protected areas is to create an environment where tigers can successfully raise young, producing what biologists call a “source population” from which animals can disperse out into adjacent lands.

In this sense, creation of real protected areas is the key component of a recovery plan for tigers in Northeast China. We have seen from Session 1 that nomadic tigers are still present in northeast China, immigrating into the region from nearby Russia. These nomadic wanderers do not appear to ever settle down, and except in the Wandashan, there is no evidence of reproduction. The primary point of creating protecting areas will be not only to provide a haven for tigers, but to create an area with sufficiently high prey densities that tigers can settle into the region and successfully raise young. Creation of a sustainable population, and the first sign of success in the recovery program, will be establishment of reproducing population of tigers somewhere in Northeast China. Creation of protected areas will be the first step towards making this happen.

A single, or set of isolated protected areas alone will not be sufficient to ensure long-term viability of a recolonizing tiger population in northeast China. Tigers require vast landscapes in the north temperate environment of northeast China, and protected areas alone will not be sufficient. It will be essential that individual protected areas are linked together to form a network of protected areas. In between strictly protected areas can be forest lands managed for multiple purposes, both for humans and tigers. Because recovery of northeast China’s tiger population is dependent on connectivity with tigers in Russia, cooperative efforts to link protected areas on both sides of the international boundaries will be essential.

A framework for this network of protected and managed lands must be established with vision and forethought. The point of this session is to discuss, and hopefully define, the framework for this network of protected areas, both across provincial and international boundaries.

# TIGER CONSERVATION PLANS IN JILIN PROVINCE

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## Introduction

Given that the Siberian tiger is near extinction, it is extremely urgent to develop a scientifically based conservation program. Developing and implementing conservation plans to assure the survival of wild tiger populations means taking comprehensive steps to accelerate reproduction and development of the current wild tiger population.

The following principles should be followed since tiger conservation planning is a complex process:

- a. Develop international cooperation with Russia and DPR Korea;
- b. Coordinate conservation efforts with Heilongjiang Province;
- c. Combine conservation with release of captive population to the wild; and
- d. Combine tiger conservation planning with natural forest protection planning.

The conservation plan is comprised of three projects:

### 1. Creation of a Chinese-Russia International Tiger Reserve

The part of a proposed reserve within Jilin should be located in middle east of Hunchun city and eastern Wangqing County in Yanbian Korean Autonomous Prefecture. The surrounding borders should be from the highway between Hunchun to Kraskino Russia, through Hunchun River, to Yangpao, Hadamen, Ying'an, Mijiang, Liangshui of Tumen, Shilipihg of Wangqing, Luozigou, boundary of Jilin and Heilongjiang Provinces, finally to the border of China and Russia. The geographic coordinates of this area are 42°45'-44°03' N, 129°45'-131° 19' E, for a total of 6,700 km<sup>2</sup> (Figure 1).

The planned reserve represents the most important area where tigers occur in Jilin. The recent survey report indicated that 3-5 tigers and 3-6 leopards occur there. Vegetation types are mainly mixed conifer, broad-leaved, and mixed broad-leaved forests. The prey species, which includes include roe deer, red deer, wild boar, Mongolian hare, and badger are fairly abundant. There is a stable population of Sika deer in the boundary area of China and Russia, and which can provide tigers with abundant food. Functionally the proposed reserve will be divided into three parts: core, buffer and management regions. The management steps for each part will be different.

### 2. Construction of tiger movement ecological corridors

#### 2.1 Construction standards for the ecological corridors

On the basis of fulfilling its function as an movement corridor for tigers, the design of corridor should retain the following standards: they should be at least wide 10 km wide to insure ecological isolation; vegetation should be mainly composed of broad-leaved forest with over 0.6 in coverage; and prey density of ungulates should be no less than 3 animals/km<sup>2</sup> to meet the needs of tigers during migration.

#### 2.2 Positioning of the ecological corridors

Placement of ecological corridors will be planned to retain as much as possible the natural distribution of tigers. That is:

**2.2.1 Connection along Chinese-Russian boundary.** Along Jilin Province, the Chinese-Russian boundary extends 232.7 km. In order to guarantee tigers and their preys free movement between China and Russia, the frontier fencing that now exists must be adjusted to provide four 10-

km un-fenced sections at roughly 50-km intervals. Border monitoring in these corridor sections will be administered by increasing the number of frontier watchtowers, setting up closed-circuit television monitoring systems and strengthening patrols.

**2.2.2 Connection among Russia, China and DPRK.** Dapanling is located in the lower basin of Tumen River at the junction of China, Russia and DPRK, and represents the only ecological corridor linking the 3 nations for tigers. Presently, a highway is planned to extend across that area from Hunchun to Jingxin Township north-south. This construction will prove extremely unfavorable for tigers attempting to move back and forth across the international boundaries.

The planned engineering steps are:

- a) to build underground passages along the Dapanling highway to ensure that tigers can move across the mountains;
- b) protect the vegetation of natural second-growth broad-leaved forest; and,
- c) reduce human activities and stop large-scale development of the Dapanling region.

**2.2.3 Connection among current distribution regions in Jilin.** Currently there are 3 isolated distribution regions for tigers in Jilin. The distance between Dalongling and Haerbaling is 130 km, and between Haerbaling and Zhangguangcailing is 70 km. According to it is important to retain the capacity for tigers to migrate between these regions. A corridor linking Dalongling and Haerbaling should be created along the boundary mountain ridges of Jilin and Heilongjiang. At present, steps should be taken to protect this area and to limit or prohibit logging the boundary forests, thereby retaining intact ecological surroundings.

Although the distance between Haerbaling and Zhangguangcailing is not too great, it is clear that these two areas are isolated and movement of animals is blocked between the 2 regions. The best ecological corridor for linking these two regions is Dunhuaxiaoshan in Jilin District. The extent of farming in this area should be controlled, and logging for farming should be strictly prohibited. There should be an effort to counter the tendency for expanding irrigation projects and fishery development, and we should stringently control environmental conditions for irrigation projects to avoid obstructing tiger summer migration routes by creating of large manmade lakes.

**2.2.4. Corridor between present distribution regions and Changbaishan Nature Reserve.** Changbaishan Nature Reserve is within the historical range of tigers distribution. Long-term plans should link the current regions where tigers occur and Changbaishan Reserve together to form a tiger migration network, which would be very important to conservation of tigers. To accomplish this, two corridors are needed.

1. The first corridor would begin from Zhangguangcailing along to Weihuling, stretching through Furling, to Huangning, Mudanling, along with Furling and finally reaching Changbaishan Nature Reserve in the Wangtiane region.
2. A second corridor would start from Haerbaling through Yingeling, and then through Zhenfengling, finally reaching the Changbaishan Nature Reserve.

### **3. Recovery of the wild tiger population in Changbaishan Nature Reserve**

Changbaishan Nature Reserve is one of China's earliest established reserves but no tigers have been reported there since 1994. To reestablish the tiger population in this region, it will be necessary to carry a program "Releasing Tigers into the Mountains". This program could be important in demonstrating the effect on recovering tigers in China and even world's endangered species. Some of the techniques, like developing "wildness" and adaptability training for introduced tigers, determining the release region and developing field monitoring techniques, are being formulated now.

# PLANS AND PERSPECTIVES FOR ESTABLISHING TIGER RESERVES IN HEILONGJIANG PROVINCE

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An international team made of the specialists from Chinese, American and Russian s conducted an Amur tiger survey in eastern Heilongjiang Province in 1999. The results show that tiger distribution in Heilongjiang decreased significantly since the early 1990s. Eastern Wandashan and Southern Laoyeling are prime tiger habitat. In 1999, there were five to seven tigers in eastern Heilongjiang; most exist largely as nomadic and isolated individuals. Data suggest that there is no longer a resident, stable population anywhere in Heilongjiang, with the possible exception of the Eastern Wandashan. Given the observations from Jilin Province, we conclude that the Amur tiger is on the verge of extinction in China and that currently it is sustained by emigration of individuals coming in from Russia. Data does support, however, a suggestion that there is suitable habitat to support prey populations and tigers in Heilongjiang: 2,000 km<sup>2</sup> in the eastern Wandashan and 1,200 km<sup>2</sup> in the southern Laoyeling. We believe that the extinction of tigers in Heilongjiang will only be averted if reserves are established to conserve this subspecies in the wild.

## Background Information

### 1. Status of Tigers

**1.1. Heilongjiang.** Tigers in Heilongjiang Province are threatened by a combination of fragmented habitat, habitat loss, and loss of prey. Tigers have disappeared in both the Greater Khingan (1970s) and the Lesser Khingan Mountains (1980s). Tiger habitat and population numbers have declined significantly. The results of three surveys since the 1970s confirm this. In Heilongjiang Province in 1974-1976, there were 81 tigers, 10-14 tigers in 1988-991, and 5-7 tigers in 1999. Now one can find tigers only along the Chinese-Russian borders of the Eastern Wandashan and the Southern Laoyeling. There are now no tigers in the Qixinglazi Reserve established in the 1980's.

**1.2. Jilin Province.** In the winter of 1998, a questionnaire distributed to local people and a field-based survey conducted by a international team of specialists determined that four to six tigers occurred in eastern Jilin Province (Yang Shihe et al. 1998). With several exceptions, most of the data shows that tigers are found close to the Russian border, opposite Southwest Primorye, Russia.

**1.3. Russia.** The status of the Amur tiger in Russia is well known after a series of surveys conducted in the past 30 years (Yudakov and Nikolaev 1970, Pikunov 1985, Matyushkin et al. 1996). The most recent survey in 1996 reported 330-371 adult Amur tigers in Primorskii and Khabarovskii Krai of the Far East Russia (Matyushkin et al. 1996). While the majority of this population survives in an intact continuous habitat of the Sikhote-Alin Mountains, there exist several fragmented populations, including four that border China (see Pikunov, Figure 1) and are of direct relevance to conservation efforts in China, including:

**1) Southwest Primorye.** A small population of tigers survives in approximately 350,000-400,000 ha of habitat in southwest Primorye. Amur tigers have always inhabited southwest Primorye, but numbers have never been high. This fragmented habitat has been virtually cut off from the main block of habitat in the Sikhote-Alin Mountain Range of Russia by development. In 1970, three individuals were recorded (Yudakov and Nikolaev 1973), in 1984-85, eight individuals occurred there, (Pikunov 1990), in 1995-1996, six individuals were reported (Matyushkin et al. 1996), and in 1998, it was estimated that 14-18 tigers existed in the region (Aramilev et al. 1998). Three protected areas in Russia - Kedrovya Pad Zapovednik (18,000 ha), Barsovy Zakaznik (97,400 ha), and the newly gazetted Borisovkoe Plateau Zakaznik (61,300 ha) - provide good protection to habitat and prey populations over a portion of this habitat patch.

**2) Pogradichny Raion.** This region borders North Laoyeling of Heilongjiang Province. An ephemeral population of tigers occurs in this region. Suitable tiger habitat in Pogradichny Raion is comprised of an isolated patch of no more than 250,000 ha. This tiger population appears to be ephemeral, with individuals appearing and disappearing periodically. No more than four tigers were reported by Yudakov and Nikolaev (1970), while no evidence of tigers was found in 1978-1979 (Pikunov et al. 1983). Tigers reappeared in the early 1990's, and in the 1996 survey, four individuals (2 adults and 2 cubs) were reported. However, a 1998 survey, simultaneous with the one conducted in Heilongjiang, failed to find evidence of tigers (Pikunov unpubl.).

**3) Strelnikov Range.** The Strelnikov Mountains border China's Wandashan Range and are connected to the Sikhote-Alin Range via a narrow forested corridor that is bisected by the Vladivostok-Khabarovsk road between the city of Luchegorsk, in Primorski Krai, and the village of Bikin, in Khabarovskii Krai. This patch of habitat includes land in both Primorski and Khabarovskii Krai. In the 1996 survey, tigers were reported in this region. However, in 1998, coincident with work in the Wandashan, a survey failed to detect presence of tigers in this region (Dunishenko unpubl. data).

**4) BolsheKhekhtsirskii Range.** A very small island of habitat is included in Bolshe-Khekhtsirskii Zapovednik, just south of the city of Khabarovsk. Two adults plus young appeared in this area during the 1996 survey after a 50-year absence. No suitable habitat exists close to this habitat patch on the Chinese side of the border. As with the Pogradichny situation, this presence of tigers in this range is also ephemeral, as it is fragmented from suitable habitat both in China and the Sikhote-Alin.

## **2. Regional Conservation Plans.**

### **2.1. A Sustainable Land-Use and Allocation Program for the Ussuri/Wusuli Watershed.**

An international planning team consisting of Chinese, Russian, and Americans developed a land-use plan for the Ussuri Basin in 1996 (Anonymous 1996). Recommendations arising from this plan included the creation of two international protected areas for large carnivores.

(1). The Big Cat (*Panthera*) International Park and Wildlife Refuge: It would be located in Southern Laoyeling of Heilongjiang Province and southwest Primorye Krai on the Russian. It includes 485,600 ha in southwest Primorye Krai on the Russian side, and 487,100 ha in Southern Laoyeling of Heilongjiang Province. Parts of Jilin Province were considered suitable for inclusion as well, and were tentatively included in the plan. Russia has, on its part, initiated the plan in 1996 by converting 613 km<sup>2</sup> into a Krai-level (Provincial) protected area, Borisovkoe Plateau Zakaznik (wildlife refuge).

(2). Wandashan National Park and International Tiger Refuge: This park would be located in the eastern Wandashan of Heilongjiang China and the Bikin area of Russia. It identified 324,700 ha in China and 1,500,000ha in Russia, which are linked through a series of wildlife protection areas (zakazniks and ecological corridors) to the Sikhote-Alin ecosystem via the Bikin watershed.

### **2.2. Natural Forests Conservation Project.**

Due to nation-wide concern over the loss and degradation of forest lands, the loss of ecosystem integrity and the reduction of wildlife resources due to high human populations and unsustainable exploitation, the Chinese government, through the State Council of China, enacted the "Natural Forests Conservation Project" in 1997. This project is a long-term attempt (1998-2050) to prevent further deterioration of the forest ecosystems, protect forest biodiversity, reduce logging intensity, enhance reforestation efforts, and to develop comprehensive forest management plans. The short-term goal (1998-2000) is to eliminate or greatly reduce logging levels to provide a recovery period for natural forests. At the same time, attempts will be made to shift timber harvest

to forest plantations with the goal of shifting 70% of timber output to plantation lands, thereby further protecting natural forests. Implementation has commenced on 135 Forest Bureaus, including those in Jilin and Heilongjiang Provinces. Timber production has decreased in 40 Forest Bureaus in Heilongjiang (with an initial focus on the Greater Khingan region). Most of the Forest Bureaus in the study region were in the process of decreasing timber output during the 1999 winter.

## **Plans for Establishing Tiger Reserves in Heilongjiang Province**

### **A. Southern and Northern Laoyeling Regions: Development of National and International Protected Areas, Tiger Management Areas and Ecological Corridors.**

Southern Laoyeling represents critical habitat for tigers in the Tumen River Population. If this region can be connected to Pogradichny Raion in Russia via Northern Laoyeling, there exists the opportunity to save these small habitat patches in the northernmost part of this tiger conservation unit.

**1. Southern Laoyeling-Suiyang Protected Area.** The southernmost portion of Suiyang Forest Bureau is the only place where tiger tracks were located over the entire survey. The tiger range is about 12,365 km<sup>2</sup>, and suitable habitat is about 1,200 km<sup>2</sup>. This region borders Jilin Province and in the 1998 survey tigers were found there and in Southwest Primorye where tigers are regularly reported. This region has great potential as a tiger and leopard reserve because it lies adjacent to a system of protected areas in Russia where both species are common.

The proposed "Big Cat (Panthers) International Park and Wildlife Refuge" (Anonymous 1996) would link protected areas in Jilin, Russia, and Heilongjiang. We endorse this proposal and recommend that a strictly protected area of approximately 1,200 km<sup>2</sup> be created in southern Suiyang Forest Bureau (Figure 2). Forests of this region are mainly mixed conifer and broad-leaved forests, and hold great potential as both tiger and leopard habitat. This proposed protected area would abut similarly proposed protected areas in the Dalongling Region of Hunchun Province (2000 km<sup>2</sup>), which has already been proposed for protection (Yang Shihe et al. 1998) and be linked to proposed protected areas in the Russian Border Region of Hunchun (500 km<sup>2</sup>). On the Russian side, three protected areas - Borisovkoe Plateau Zakaznik (613 km<sup>2</sup>), Barsovy Zakaznik (974 km<sup>2</sup>), and Kedrovya Pad Zapovednik (180 km<sup>2</sup>) - already exist and form a connected network of protected areas. Together, these protected areas would represent a complex of protected habitat encompassing nearly 5,500 km<sup>2</sup>. In Heilongjiang the proposed Southern Suiyang protected area should be created with federal level protection, while efforts are made to raise its status to the international level, to be managed in conjunction with the Russian side.

**2. Tiger Management Areas.** In both Southern Laoyeling and Northern Laoyeling there exists potential tiger habitat in Suiyang and Muling Forest Bureaus, and possibly also in Bamiantong Forest Bureau in the north. These regions should come under a special management regime that minimizes human impact to tigers, leopards, and potential prey. International cooperation should be developed to manage Pogradichny Raion of Primorskii Krai Russia in connection with Northern Laoyeling. If populations of prey species start to recover in these management areas, and if tigers recolonize the proposed protected area in Suiyang, dispersal and settlement into these management areas of China and Russia can be expected.

**3. Ecological Corridors.** Presently Northern Laoyeling is probably isolated from Southern Laoyeling by degraded, heavily used habitat and a major highway that crosses this region. On the Russian side, Pogradichny habitat represents an island of habitat connected only to Northern Laoyeling. We propose creation of an ecological corridor that links Northern and Southern Laoyeling (see Miquelle, Figure 1). Restoration of this region, and strict protection, could provide a linkage for tigers, leopards, and other wildlife to move between these two segments of Laoyeling. Without creation of an effective corridor, Northern Laoyeling cannot support tiger or leopard populations because it is simply too small an area, even in conjunction with habitat in Pogradichny Raion.

A second ecological corridor via Dongjingcheng Forest Bureau could link Southern Laoyeling with Southern Zhangguangcailing Region. We consider this process a long-term plan, and do not develop the concept further here because we believe that conservation efforts in Heilongjiang should focus on quality habitat patches close to the Russian border.

**B. Eastern Wandashan Mountains: development of a specially protected area (national and international), Tiger Management Areas, and an ecological corridor to nearby Russian tiger habitat.**

**1. Eastern Wandashan Shendingfeng Protected Area.** Total potential habitat for tigers in the Eastern Wandashan Mountains exceeds 5,000 km<sup>2</sup>. However, the majority of recent locations, and the most secure habitat, exists in a region surrounding Shendingfeng Mountain. We propose creating a specially protected area of approximately 2,000 km<sup>2</sup> in the central core of the Eastern Wandashan, with linkages to the Russian border (see Miquelle, Figure 1). This protected area would safeguard what appears to be the best remaining habitat for tigers in northeast China, and protect the last region where evidence of reproduction still exists. Forests of this region are mainly mixed Korean pine and broad-leaved forests, and broad-leaved forests. A protected area of 2,000 km<sup>2</sup> could contain at least 4 resident females, and perhaps 8 or more tigers in total.

**2. Eastern Wandashan Tiger Management Areas.** The remaining forested habitat in Dongfanghong Forest Bureau, north and south of the specially protected areas, and perhaps parts of Yingchun Forest Bureau would be managed as Tiger Management Areas. In total, tiger management areas would encompass approximately 3,000 km<sup>2</sup>. These lands would be critical habitat for what we hope would be an expanding tiger population in the Wandashan with appropriate management strategies.

**3. Develop an ecological corridor between Eastern Wandashan and Sikhote-Alin Mountains via the Strelnikov Range in Russia.** The key to survival of the Wandashan tigers will be an ecological corridor that links the Wandashan tigers to the Sikhote-Alin population in Russia. Evidence that tigers presently cross the Ussuri River (international boundary) exists (Xiaochen Yu, unpublished data), and emphasize the need to secure this natural corridor. Only one place exists where such a corridor is possible -linking the central part of the Wandashan with the Strelnikov Range on the Russian side. Agencies on the Chinese side will be responsible to insure that key habitat is protected on their side of the border to insure that exchange of tigers is possible. Meetings between the appropriate Russian and Chinese Ministries should be initiated in the near future to secure this key corridor. The patch of habitat represented by the Strelnikov Range is bisected by the primary road linking Vladivostok and Khabarovsk, and parts of this range occur in both Khabarovskii and Primorskii Krai. Forest tracts exist on both sides of the road, making exchange possible, but there exists a relatively narrow band of forest habitat left that could provide a travel corridor from the Bikin River Basin into the Strelnikov Range, and ultimately, to the Wandashans. On the Russian side of the border, discussions must be initiated to secure this parcel of habitat.

# A PROPOSED INTERNATIONAL SYSTEM OF PROTECTED AREAS FOR AMUR TIGERS

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## INTRODUCTION

The key component of a recovery plan will be the development of a habitat protection plan for tigers that will provide a secure haven for tigers to survive and reproduce. Connectivity between the Chinese provinces of Heilongjiang and Jilin, and linkages between tigers in these two provinces and the populations in Russia will be essential for long-term viability. We propose a 5-stage process for creating a system of protected areas and tiger management units: 1) define the units of tiger populations that need to be protected; 2) define some of the assumptions used in creating this plan; 3) for each subpopulation, define where i) protected areas, ii) management zones, and iii) ecological corridors must be created. In this paper, we propose a set of plans that include all existing tiger populations. Concrete recommendations for management regimes within each of these areas has been provided elsewhere (Yang Shihe et al 1998, Sun Baogang et al 1999).

Often, creation of strictly protected areas is seen as a liability and loss of potential resources, because economic activities must be prohibited if protected areas are to achieve their intended goals. However, with the enactment of the Project for Protection of Natural Forests by the Chinese government, tiger and leopard conservation, creation of protected areas, and goals established for this project can be attained simultaneously. Creation of protected areas on Forest Bureau lands will protect natural forests and ecosystem integrity, increase wildlife populations, and provide key habitat for tigers. Thus, tiger conservation is compatible with existing legislature to protect forests in Heilongjiang and Jilin Provinces.

Furthermore, the majority of lands where tigers may exist should be delineated not as highly protected areas, but as "tiger management zones." These are usually Forest Service regions that are considered suitable tiger habitat, but can be managed for multiple purposes, including human use, as long as the needs of tigers are accommodated. Thus, a large majority of lands where tigers could exist in China can still be used for production of timber and other human needs.

### 1. Definition of Subpopulations

Based on the results of the surveys in Jilin, Heilongjiang, and the Russian Far East (Sun Baogang et al. 1999, Yang Shihe et al. 1998, Matyushkin et al. 1996), it appears that Amur tigers presently exist in two, almost completely isolated populations.

**1) *The Tumen River Tiger Population.*** This population consists of tigers in southwest Primorye Krai (Khasan, Nadezhdinsky, and western Ussuriski Raions), western Primorye (Pogranichny Raion) Russia, Hunchun and Wangqing Counties of Jilin Province, Southern and Northern Laoyeling Region, and the Zhangguangcailing Region of Heilongjiang. It is yet unknown whether tigers in North Korea may be connected to this population; if so, they may later be added to this tiger conservation unit. Tigers in Northern Laoyeling and Pogranichny Raion, Russia (if any still exist) may already be isolated from this population, in which case we recommend that efforts be made to reconnect this region by restoring habitat in a proposed ecological corridor between Southern and Northern Laoyeling (see below). This population presently consists of approximately 9-15 animals, with the majority in Southwest Primorye.

**2) *The Sikhote-Alin-Wandashan Tiger Sub-population.*** The population represents at least 95% of the remaining wild Amur tigers in the world, and the majority of that population is situated in the Sikhote-Alin Mountains of Primorskii and Khabarovskii Krai in Russia. Tigers in the Wandashan Mountains of northeast Heilongjiang Province, China, are connected to the Sikhote-Alin metapopulation via the Strelnikov Range in Russia. In this paper, we discuss only the need for

protected areas in the Wandashan area of Heilongjiang and the linkages required into Russian territory.

As it is highly unlikely that these two populations of tigers will ever be reconnected, we propose that it is important to acknowledge this fact and manage the existent tigers and potential tiger habitat in northeast China and Far East Russia as two separate populations. Conservation plans should insure long-term viability of each of these populations assuming isolation will continue in the future.

## **2. Assumptions for Developing an International Protected Areas Plan**

Our proposals for a land-use plan are based on the following assumptions.

**1) Manage two subpopulations.** First, as stated above, tigers in Heilongjiang should be managed as two populations, and conservation plans should insure long-term viability of each of these populations assuming complete isolation from each other.

**2) Ensure connectivity along provincial and international boundaries.** The best chance for recovery of wild populations of tigers and leopards in both Heilongjiang and Jilin will be to insure connectivity with existing populations in Russia. Under present conditions, the scattered individuals in Jilin and Heilongjiang do not represent viable populations of tigers, and will surely go extinct without emigration from Russia. If a recovery plan is to be implemented, the quickest, cheapest and most effective means for insuring recovery is to protect transboundary habitat to provide a mechanism for exchange of tigers between the two countries. Existing protected areas in northern China created for tigers (Changbaishan in Jilin and Qixinglazi in Western Wandashan) no longer harbor tigers because these regions are isolated fragments of habitat with no means for tigers to emigrate into these areas. If habitat is protected in China along the Russian border, and ungulate populations increase, emigrating tigers will establish permanent residence in China, and, as protection increases and prey populations reach sufficient densities, tigers will begin reproducing. Long-term viability of tigers on both the Russian and Chinese side will be greatly enhanced if tigers are managed jointly as single transboundary units. Therefore, we focus our proposals for protected areas along the Russian border for both the Tumen River Tiger Population and the Wandashan subpopulation because these areas have the greatest potential for protecting tigers, as evidenced by the fact that some tigers still occur there.

**3) Basis for extrapolating potential population sizes.** We attempt to estimate the potential of the habitat proposed for protection to harbor tigers by estimating the number of tigers that could be contained in each protected unit. Based on data collected in Russia (Miquelle et al. 1999), we assume that in high quality, well-protected habitats, each adult resident female requires 470 km<sup>2</sup> to live and raise young. In areas that are not as well protected, or contain lower quality habitat, we apply a habitat value rating that adjusts adult female density to lower levels by 25% increments. This habitat value rating is a crude attempt to evaluate the near-term potential of areas to harbor tigers. Based on 20 years of survey data in Sikhote-Alin Zapovednik (1973-1993) we further assume that, in calculating the number of tigers, the ratio of adult females to adult male tigers is approximately 2.2:1, and that the ratio of adult females to subadult tigers is approximately 1.9:1 (Smirnov and Miquelle 1999).

## **3. Proposed Protected Areas Network for the Tumen River Tiger Subpopulation.**

### **3.1. Proposed Strictly Protected Areas for the Tumen River Tiger Subpopulation**

Presently, tigers in this region are largely restricted to Southwest Primorye. It is essential to create protected areas on the Chinese side of the border to increase the amount of suitable habitat, and provide an “incentive” for tigers to immigrate into China. Hunchun County, Jilin, and Southern Laoyeling Heilongjiang, represent critical habitat for tigers in the Tumen River region. If this

region can be connected to Pogranichny Raion in Russia via Northern Laoyeling, there exists the opportunity to save these small habitat patches in the northernmost part of this tiger conservation unit and northernmost leopard habitat.

We propose the following areas should be included in a cluster of protected areas:

**1) Southern Laoyeling-Suiyang Protected Area, Heilongjiang.** The southernmost portion of Suiyang Forest Bureau is the only place where tiger tracks were located over the entire 1999 survey in Heilongjiang.

**2) Dalongling-Hunchun Protected Area, Jilin.** Both tigers and leopards readily cross the international boundary between Russia and China, and prey densities are some of the highest in Jilin close to the border. Further to the west in this region, potential habitat exists, but prey densities are extremely low – the region must be protected for prey populations to rebound. On the Russian side of the border, the newly created Borisovkoe Plateau Zakaznik provides good protection, which could be of great assistance in recovering ungulate populations in this region, and is a natural source for dispersing leopards and tigers. The forests of this region are well-managed, and human impact is not severe. Dalongling has suitable habitat for both leopards and tigers, and along with the Chinese-Russian Border Region, must be considered vital for creation as a protected area.

**3) Border Region, Jilin.** This region has great potential as a tiger and leopard reserve because it lies adjacent to a system of protected areas in Russia where both species are common. From Chunhua south along the Chinese-Russian border there is excellent habitat for both tigers and leopards. Sufficient prey exists in this region, but human pressures from both the Russian and Chinese side threaten to degrade this finger of habitat. This region, along with Dalongling, is in critical need of protection if the Far Eastern leopard is to survive in the wild. Protection of this region is critical if expansion of tigers into Jilin from Russia. It will be essential to manage both sides of the border as a single, conservation unit. Dispersal/migration corridors will need to be re-established.

**4) Southwest Primorye.** In Southwest Primorye, Russia, there already exist 3 protected areas: Borisovkoe Plateau Zakaznik (wildlife refuge), which lies adjacent to the Dalongling and Suiyang regions of Jilin and Heilongjiang, respectively, Barsovy Zakaznik, which lies adjacent to the Border Region in Jilin, and Kedrovya Pad, a small reserve on the coast that is linked to Barsovy. These regions key areas that are already protected, but upgrading the level of protection is necessary.

The protected areas in the Dalongling Region of Hunchun County, Jilin (2000 km<sup>2</sup>) has already been proposed for protection (Yang Shihe et al. 1998) and can be linked to proposed protected areas in the Russian Border Region of Hunchun (500 km<sup>2</sup>) (Table 1, Figure 1). On the Russian side, three protected areas - Borisovkoe Plateau Zakaznik (613 km<sup>2</sup>), Barsovy Zakaznik (974 km<sup>2</sup>), and Kedrovya Pad Zapovednik (180 km<sup>2</sup>) – already exist and form a connected network of protected areas (Table 1). Together with Southern Suiyang, these protected areas would represent a complex of protected habitat encompassing nearly 5,500 km<sup>2</sup>. In Heilongjiang and Jilin the proposed protected areas should be created with federal level protection, while efforts are made to raise its status to the international level, to be managed in conjunction with the Russian side.

### **3.2. Proposed Tiger Management Zones for the Tumen River Tiger Subpopulation**

In Heilongjiang, both Southern Laoyeling and Northern Laoyeling regions represent potential tiger habitat in Suiyang and Muling Forest Bureaus, and possibly also in Bamiantong Forest Bureau in the north. In Jilin Forest lands in the northern sections of Hunchun and Wangqing Counties also represent valuable potential tiger habitat. These regions should come under a special management regime that minimizes human impact to tigers, leopards, and potential prey. International cooperation should be developed to manage Pogranichny Raion of Primorskii Krai Russia in connection with Northern Laoyeling. If populations of prey species start to recover in these management areas, and if tigers recolonize the proposed protected area in Suiyang, dispersal and settlement into these management areas of China and Russia can be expected.

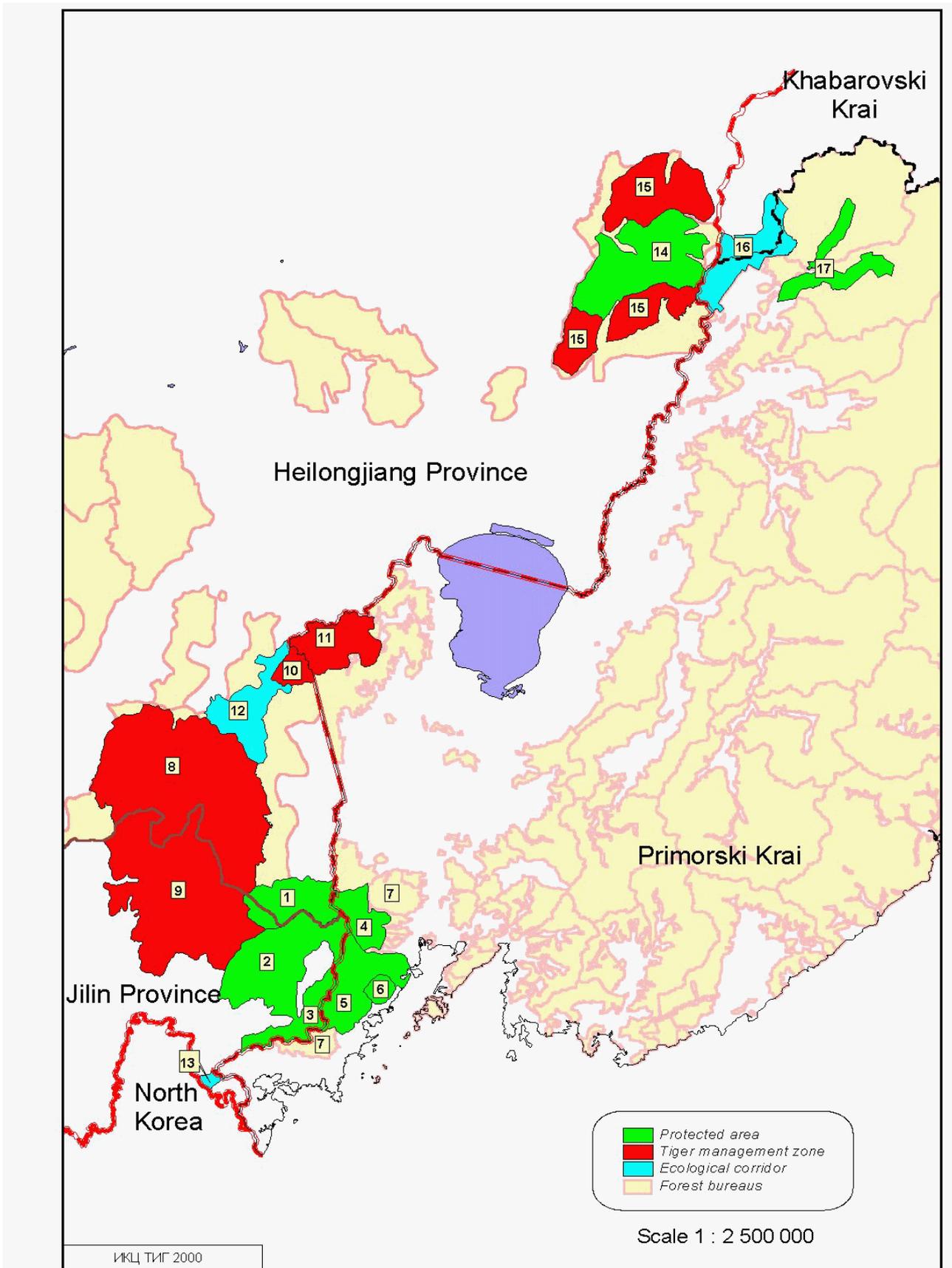


Figure 1. Proposed system of protected areas and tiger management zones in Heilongjiang and Jilin Provinces, Northeast China, and adjacent areas in the Russian Far East. Numbers on map for proposed protected areas, tiger management zones, and ecological corridors correspond with Table 1.

### 3.3. Proposed Ecological Corridors for the Tumen River Tiger Subpopulation

1. **Tumen River Corridor.** The opportunity for movement of animals between North Korea, China, and Russia occurs only in one locale in Jingxin, Jilin along the Tumen River. There exists a small mountainous zone that extends across the entire Chinese portion of this region between North Korea and Russia centered around N 42° 42' and E 130° 23'. This region has suitable habitat for both tigers and leopards (the presence of a tiger was confirmed in this region during the survey - Table 5), and if properly managed, could develop a sufficient prey base for predators to persist. We propose strict protection of this region, and the necessary legislature for creation of a protected area that would act not only as a travel corridor for tigers and leopards, but as an ecological linkage for all components of the mountainous ecosystems of this tri-country region. At its narrowest point, North Korea and Russia are separated by approximately 10-15 km, a distance that could be easily traveled by a tiger in a single day, if there are no barriers to movement. Presently, we do not know if suitable habitat exists on the North Korean side of the Tumen River, and it is therefore of the highest priority to survey this region. In the meantime, it is recommended that China consider protecting a region across the entire width of this narrow finger of territory from the Russian border to North Korea.
2. **Laoyeling Corridor.** Presently Northern Laoyeling is probably isolated from Southern Laoyeling by degraded, heavily used habitat and a major highway that crosses this region. On the Russian side, Pogranichny habitat represents an island of habitat connected only to Northern Laoyeling. We propose creation of an ecological corridor that links Northern and Southern Laoyeling (Figure 1). Restoration of this region, and strict protection, could provide a linkage for tigers, leopards, and other wildlife to move between these two segments of Laoyeling. Without creation of an effective corridor, Northern Laoyeling cannot support tiger or leopard populations because it is simply too small an area, even in conjunction with habitat in Pogranichny Raion.
3. **Zhangguangcailing Corridor.** A third ecological corridor via Dongjingcheng Forest Bureau could link Southern Laoyeling with Southern Zhangguangcailing Region (not shown on map). We consider this process a long-term plan, and do not develop the concept further here because we believe that conservation efforts in Heilongjiang should focus on quality habitat patches close to the Russian border.

### 3.4. Potential Number of Tigers in Tumen River Population.

Based on our projections, we estimate that 2-3 breeding females could establish home ranges in the proposed protected area of Southern Suiyang, and that collectively across both provinces and countries, this population could have as many as 21 adult females and a total population of approximately 42 individuals (Table 1). The existent Tumen River population that exists in southwest Primorye, which numbers less than 15 individuals, is not viable in the long-term. Linking this primarily Russian population to protected areas in China that harbored reproducing populations of tigers would greatly increase the probability of survival.

#### **4. Proposed Protected Areas Network for the Eastern Wandashan Mountains Tiger Subpopulation.**

##### **4.1. Proposed Strictly Protected Areas for the Wandashan Mountains Tiger Subpopulation**

*1. Eastern Wandashan Shendingfeng Protected Area.* Total potential habitat for tigers in the Eastern Wandashan Mountains exceeds 5,000 km<sup>2</sup>. However, the majority of recent locations, and the most secure habitat, exists in a region surrounding Shendingfeng Mountain. We propose creating a specially protected area of approximately 2,000 km<sup>2</sup> in the central core of the Eastern Wandashan, with linkages to the Russian border (Figure 1). This protected area would safeguard what appears to be the best remaining habitat for tigers in northeast China, and protect the last region where evidence of reproduction still exists. A protected area of 2,000 km<sup>2</sup> could contain at least 4 resident females, and perhaps 8 or more tigers in total (Table 1).

##### **4.2. Proposed Tiger Management Zones for the Wandashan Tiger Subpopulation**

*1. Eastern Wandashan Tiger Management Areas.* The remaining forested habitat in Dongfanghong Forest Bureau, north and south of the specially protected areas, and perhaps parts of Yingchun Forest Bureau would be managed as Tiger Management Areas (Figure 1, Table 1). In total, tiger management areas would encompass approximately 3,000 km<sup>2</sup>. These lands would be critical habitat for what we hope would be an expanding tiger population in the Wandashan with appropriate management strategies.

##### **4.3. Proposed Ecological Corridors for the Wandashan Tiger Subpopulation**

*1. Ecological corridor between Eastern Wandashan and Sikhote-Alin Mountains via the Strelnikov Range in Russia.* The key to survival of the Wandashan tigers will be an ecological corridor that links the Wandashan tigers to the Sikhote-Alin population in Russia. Evidence that tigers presently cross the Ussuri River (international boundary) exists (Xiaochen Yu et al 2000), and emphasize the need to secure this natural corridor. Only one place exists where such a corridor is possible – linking the central part of the Wandashan with the Strelnikov Range on the Russian side. Agencies on the Chinese side will be responsible to insure that key habitat is protected on their side of the border so that exchange of tigers is possible.

##### **4.4. Potential Number of Tigers in Wandashan Subpopulation.**

The combination of Shendingfeng Protected area, Tiger Management Areas in the Wandashan, and the Strelnikov Ecological Corridor have the potential to contain as many as 9 resident adult tigresses, and perhaps a total population of approximately 17 individuals (Table 1). Such a small population is probably not viable if isolated, but if plans are properly implemented, there will be continuous exchange with tigers from the largest existent tiger habitat patch for Amur tigers - the Sikhote-Alin Range, where approximately 90% of all Amur tigers reside. As long as the potential for exchange is secured, the probability of long-term survival of tigers in Wandashan would be high.

These recommendations are based on results of two surveys in Northeast China between 1998 and 1999, and discussions with many experts on both sides of the international border. We are hopeful that in the coming days and months, there will be an opportunity to consider these proposals and discuss ways to promote creation of protected areas in Northeast China. I am firmly convinced that such a system of protected areas, if created and well managed, would secure a future for tigers in Jilin and Heilongjiang Provinces for the foreseeable future.

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**Table 1. Proposed system of transboundary protected areas and tiger management areas in Heilongjiang Province, and adjacent territories of Jilin Province and Russia.**

Tiger population	Name	Country	Province	Forest Bureau	Status	Area (km <sup>2</sup> )	Habitat value rating	Projected potential number of tigers			
								Adult females	Adult males	Sub-adults	Total
<b>Tumen River Tiger Population</b>											
I. Big Cat ( <i>Panthera</i> ) International Protected Area											
	1	China	Heilongjiang	Southern Suiyang	proposed	1200	1	2.6	1.2	1.3	5.1
	2	China	Jilin	Dalongling-Hunchun	proposed	2000	1	4.3	1.9	2.2	8.4
	3	China	Jilin	Border Region-Hunchun	proposed	500	1	1.1	0.5	0.6	2.1
	4	Russia	Primorye	Borisovkoe Plateau Zakaznik	created 1996	613	1	1.3	0.6	0.7	2.6
	5	Russia	Primorye	Barsovy Zakaznik	created	974	1	2.1	0.9	1.1	4.1
	6	Russia	Primorye	Kedrovya Pad Zapovednik	created 1916	180	1	0.4	0.2	0.2	0.8
	7	Russia	Primorye	Khasan-Nadeshdenki-Ussurisk Forest Districts	existent	1605	0.75	2.6	1.2	1.3	5.1
II. Southern Laoyeling Tiger Management Zone											
	8	China	Heilongjiang	Suiyang Forest Bureau	proposed	5000	0.25	2.7	1.2	1.4	5.3
	9	China	Jilin	Dajuaoggou District-Wangqing	proposed	5000	0.25	2.7	1.2	1.4	5.3
III. Northern Laoyeling-Pogranichny Tiger Management Zone											
	10	China	Heilongjiang	Suiyang Forest Bureau	proposed	300	0.5	0.3	0.1	0.2	0.6
	11	Russia	Primorye	Pogranichny Raion	proposed	1000	0.5	1.1	0.5	0.6	2.1
IV. Ecological Corridor between Northern and Southern Laoyeling											
	12	China	Heilongjiang	Suiyang Forest Bureau	proposed	1000	0.25	0.5	0.2	0.3	1.1
V. Tumen River Ecological Corridor between Khasan Russian and DPR Korea											
	13	China	Jilin	Hunchun District	proposed	75	0.25	0.0	0.0	0.0	0.0
Total potential size of Tumen River Tiger Population based on projections:								21	10	11	42
<b>Wandashan Tiger Sub-population (part of the Sikhote-Alin metapopulation)</b>											
VI. Eastern Wandashan Shengdingfeng specially protected area											
	14	China	Heilongjiang	Dongfonghong	proposed	2000	1	4.3	1.9	2.2	8.4
VII. Eastern Wandashan Tiger Management Area											
	15	China	Heilongjiang	Dongfonghong-Yingchun	proposed	3000	0.5	3.2	1.5	1.7	6.3
VIII. Strelnikov Range Corridor											
	16	Russia	Primorye-Khabarovsk		proposed	500	0.5	1.3	0.6	0.7	2.5
Total potential size of the Wandashan Tiger Sub-population based on projections:								9	4	5	17

## **SESSION 3. IMPROVING INTERNATIONAL COOPERATION AND ESTABLISHING TRANSBOUNDARY PROTECTED AREAS**

### **Introduction to Session 3.**

As outlined in the previous two sections, it is clear that survival of the Amur tiger in the wild in northeast China is largely dependent on an influx of tigers from the Russian population. The probability of survival of tigers on both sides of the border will be greatly enhanced if these two countries can work together to manage tigers and biodiversity in general across their vast border regions.

Evidence that cooperation can occur is abundant. The “Sustainable land use and allocation program for the Ussuri/Wusuli River watershed” is a plan for joint management of natural resources on both sides of the border. A recently signed protocol on tiger management provides a basis for future cooperative talks, and the Tumen River GEF Biodiversity Planning process provides an opportunity to develop cross-boundary plans.

The purpose of bringing together representatives of both countries at this meeting was to provide opportunities for members of responsible agencies to learn about plans for tiger protection, to exchange views on what needs to be done, and hopefully, to lay out a schedule of necessary future activities. These proceedings, therefore, act as a first statement of an ongoing dialogue between representatives at both the regional and national levels.

## STATUS OF TIGER PROTECTION IN THE RUSSIAN FEDERATION

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I would first of all like to thank Workshop organizers for the invitation to take part in the work of such an important forum.

The threatening situation in Russia began to take form at the beginning of the 1990s when, according to the estimates of specialists, up to seventy tigers a year were being killed. Russian and the international community, at different levels, expressed their concern over the situation as it had evolved, thousands of letters were sent to the President of Russia with a request to take immediate measures to save the Amur tiger. These pleas were heard and in 1995, the government of the Russian Federation adopted a special decree for protecting the Amur tiger in Primorskii and Khabarovskii Krai. The government of the Russian Federation, in this decree, ordered a Federal target program to protect the Amur tiger be developed and presented for approval, as well as to provide financial and material support to special anti-poaching teams, to improve the effort to fight illegal trade and export abroad of tigers and their parts.

In 1996 a National Strategy for protecting the Amur tiger in Russia that was developed by Russian scientists with the financial support of WWF the strategy was approved. In 1997 the government of the Russian Federation approved a Federal target program "The Protection of the Amur Tiger - 1998-2003," in which there is a detailed description of the measures essential for tiger protection: schedule for their implementation, who is responsible for their execution, and scheduled funding. The program stipulates that approximately 40% of the funds will come from the Federal budget, 20% from local budgets and the rest from various private foundations.

Legal mechanisms were adopted to protect the tiger at the regional level. For example, on December 30, 1999, the administrations of Primorskii and Khabarovskii Krai, in Decree No. 451, adopted the "Rules on How People Should Behave and Maintain Livestock In Areas of Tiger Habitat" that were prepared by Russian Far Eastern scientists with financial support of the Rhinoceros Tiger Conservation Fund, U.S. Fish and Wildlife Service.

I have provided this detailed description of the legislative basis for tiger protection in Russia because it, in my view, it may prove useful for our Chinese colleagues as they begin their work on developing a recovery plan for the Amur tiger in China.

During Boris Yeltsin's trip to Beijing in 1997, a Sino-Russian Intergovernmental Protocol on Tiger Protection was signed. Upon its completion, we sent the Chinese all of our material on tiger protection in Russia with a proposal to create a standing commission to implement the Protocol. The signed protocol facilitated close working conditions among Russian and Chinese scientists and led to the first joint field exercises carried out in both China and Russia.

Heartened by the conclusion of a Protocol on Tiger Protection, we proposed to the Chinese to sign an analogous Protocol on Far Eastern Leopard Protection. China, however, responded, and quite reasonable, arguing that it doesn't make any sense to conclude an agreement for each animal species and they proposed to sign an Agreement between the People's Republic of China and the Russian Federation Committee on Ecology on protecting wild animals and their habitat. The project was favorably received by Russia, but procedural issues arose upon completion. The fact is that in China all wild animals, aside from marine animals, are under the jurisdiction of the State Forestry Administration, whereas in Russia several agencies are responsible for their protection: Russian Federation Committee on Ecology, Ministry of Agriculture, Russian Federation Committee on Forestry. We are currently working with our Chinese colleagues to eliminate the obstacles facing completion of this agreement.

Thank you for your attention.

## **IMPROVING INTERNATIONAL COOPERATION AND ESTABLISHING TRANSBOUNDARY PROTECTED AREAS: ROUNDTABLE DISCUSSION**

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Respected Colleagues, Comrades, and Gentlemen!

Allow me to thank the organizers of this seminar for the opportunity provided to meet and to discuss with you issues of international cooperation and transboundary protected territories.

Primorye is one of Russia's youngest administrative districts. The Krai was organized in 1938 and covers a territory of 16,500,000 hectares. Primorskii Krai's unique fauna is a result of its geographic location and of the variety of habitats found in the Sikhote-Alin Mountains. There are unique natural communities in Primorye that are distinguished by a unique animal and plant assemblage found nowhere else in the world. There are many southeast Asian and Eurasian animal species present in the region as a result of a mix of terrestrial fauna from various bio-geographic provinces. There are 81 land mammals, of which 55 are common with China, 43 with Korea and 35 with Japan. Protection of animal biodiversity is carried out in tandem with the protection of the plant kingdom. More than 2,000,000 hectares of protected territory exist in Primorskii Krai. This is 13% of the total territory of Primorskii Krai. There are six federal zapovedniks, a national park, twelve nature reserves, a botanical garden, a treatment and recovery site, recreational sites and nature monuments. By 2005, with the establishment of three Federal national parks, the volume of protected territories in Primorskii Krai will grow to 18%.

I believe, that in organizing an international protected territory to protect Amur tiger and Far Eastern leopard populations, Nadezhdinsky, and part of Ussuriisky, Khasansky and Oktyabrsky Raion in Primorskii Krai are of perspective interest. The zapovednik, Kedrovaya Pad, created in 1916, is located here. Kedrovaya Pad is one of the oldest zapovedniks, not only in the Russian Far East, but in all of Russia. There is the Federal Reserve Barsovy, the regional reserves Borisovsky Plateau and Poltavsky, the Khasansky Nature Park and the Far Eastern Marine Zapovednik. All three of the reserves are adjacent to the border with the People's Republic of China.

Establishment of a protected territory adjacent to a national border where there are similar land use regimes in an adjacent territory make it possible to protect and restore natural resources and their systems, to support ecological balance for these species, as well as to promote an exchange of environmental information.

A significant impediment to establishing these territories is the presence of fencing and border structures used by border guards that block the transboundary migration of wild animals. This problem can be resolved only through a dialogue between the governments of the People's Republic of China and the Russian Federation.

Since the Amur tiger, a world heritage belonging to all peoples, is Federal property, the government of the Russian Federation issued a Decree on August 7, 1995 on "Protecting the Amur Tiger and Other Rare and Endangered Animal and Plant Species in Primorskii and Khabarovskii Krai." On June 24, 1996, the former Ministry of the Environment and Natural Resources approved a "Strategy for Protecting the Amur Tiger." To implement this Decree, on July 8, 1997, the government approved a Federal Target Program: "Protection of the Amur Tiger and its Habitat - 1998-2003," which stipulates not only interdiction of poachers and prevention of habitat destruction, but also recovery and protection measures to assure adequate prey (wild ungulates), the natural prey base for tigers.

In 1992, a program entitled "A Long-Term Plan for Environmental Protection and Rational Natural Resource Use in Primorskii Krai Through the Year 2005" ("Environmental Program") was

developed and approved in Primorskii Krai. A program for the recovery of wild growing ginseng was adopted in 1997; this program, in its own way, also addresses the tiger issue. As part of the USAID sponsored Russian American Environmental and Technology Project (EPT), a Biodiversity Conservation Strategy for the Sikhote-Alin was prepared, and then approved in 1998 with a Decree of the Governor of Primorskii Krai. A goal of the strategy is to optimize protected territories. The Federal Committee on Ecology and the Primorskii Krai Committee on Natural Resources developed "Rules on How People Should Behave and Maintain Livestock In Areas of Tiger Habitat" that were approved in July 1999 for use in Primorskii and Khabarovskii Krai. And thanks to the ongoing support of international foundations, we have managed to accomplish a great deal and we hope for continued close collaboration in the future.

I believe that our Chinese colleagues would be well advised to develop and propose an analogous set of documents for consideration and approval by the government of the People's Republic of China and by government officials in Heilongjiang and Jilin Provinces. With this, it will be possible to adopt, at the intergovernmental Sino-Russian level, a series of documents defining a plan for joint efforts to protect and restore tiger populations in both countries, including the establishment of network of protected territories. Chinese specialists need to:

- carry out an inventory of suitable habitat for Amur tigers;
- define, based on an evaluation of the quality of habitat, the optimal number of tigers and its prey for each specific territory;
- develop a set of tiger protection measures; and,
- examine all the "tiger expenses" that requires target financing.

At the international level, legal issues need to be examined to assure that an optimal number of Amur tigers, that corresponds to the carrying capacity of its habitat and the potential productivity of the tiger's population, is targeted.

It must be remembered that the creation of protected territories means withdrawing from commercial use and forsaking revenues from these lands. In addition, the territories themselves demand substantial financial support. I also want to point out that, based on our experience, the tiger's and local peoples' interest must mesh. The mechanism to protect the Amur tiger must have the support of local people and demonstrate a need for people and tigers to be interested in each other's survival. Strategically, the issue of the Amur tiger will not be solved until local people begin to live by the principle: the more the tigers, the better. Attempts to protect tigers from poaching, to carry out propaganda efforts aimed at protecting the tiger, improvement in methods to control the export of tiger by-products, unfortunately, are not having the desired effect. Local people must become interested in increasing and maintaining tiger numbers.

## RECOVERY OF THE WILD TIGER POPULATION IN NORTHERN CHINA

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Identifying key issues in a population recovery plan for the wild Amur tigers of northern China is a complex task whose resolution requires the close cooperation of not just the People's Republic of China and the Russian Federation, but also of other interested governments. There are three key issues: 1) Define key problems and ways to solve them; 2) Set a time schedule for implementing a Recovery Plan For The Wild Amur Tiger Population In Northeast China; 3) Study the experience of Sino-Russian cooperation in environmental protection and biodiversity protection.

The first issue is not just one of defining key issues and searching for ways to solve them, but also of defining what role participants generating such a recovery plan will play. The list of participants include two Chinese provinces: Heilongjiang and Jilin, two Russian Krai: Primorskii and Khabarovskii, scientists and specialists from these regions, scientists and specialists from international conservation organizations, as well as sponsors and funders, such as the US Fish and Wildlife Service's Rhinoceros and Tiger Fund, and Wildlife Conservation Society.

The key issues should be examined in light of this hierarchical arrangement and then be divided into three areas: a) international, 2) governmental, 3) territorial.

### A. International

At the international level, the most important issues are:

a) finding sources to restore wild tiger populations; b) determining, through a retrospective examination, the reasons why wild tiger populations disappeared in northern China.

An important first step is to recognize the value of the wild tigers living in the Ussuriysky taiga of Primorskii and Khabarovskii Krai of the Russian Federation in developing a recovery plan. This population is not "polluted" by inter-species breeding and is a "pure" bloodline. With full justification, any suggestion to restore the Amur tiger population with animals from zoos has been rejected. The specialists and government representatives attending this workshop recognize this fact.

The next, more complex issue is determining why wild tigers disappeared. This requires a sober historic analysis of the annual decline of wild tigers populations in northern China. A detailed study should be undertaken by Chinese scientists and specialists from the international community. The study will naturally require a substantial financial commitment and a great deal of time to collect information for such a lengthy period, to make the analysis, and to complete a final report. We must recognize the significant contribution made by the Rhinoceros and Tiger Fund in sponsoring this workshop and are obliged to express a hope that a similarly fruitful experience will come from a project to determine the reason why wild tigers in northern China disappeared.

### B. Government

The government must recognize two facts:

- 1) the issue of restoring wild tigers is a national issue;
- 2) work with the public sector should be carried out not only with the people living in the two Provinces where tigers live; there should also be a national program for tiger conservation among all those living the People's Republic of China.

The first fact is generally recognized in China. The People's Republic of China has laws and specific agencies have regulatory rules intended to protect and conserve tigers. There should also be an exchange of knowledge used to expand the range of legal instruments needed not only to protect and conserve tigers, but to also address such issues as:

- 1) preparation of suitable tiger habitat;
- 2) training the local populace in how to respond during encounters with tigers;
- 3) improving the governmental management of wild tigers;
- 4) establishing contacts with the Russian Federation on wild tiger restoration issues, including agreements on establishing the parameters for protected territories for migrating tigers.

A government decision to restore wild tiger populations is essential in light of the lengthy process and the substantial expense involved. Similarly, one must create suitable conditions for survival of tigers, and one cannot leave local people out of this equation. Tigers and local people are, to some extent, competitors for natural resources. In restricting the employment opportunities for local people living in tiger habitat, measures must be taken to develop a compensation system and a government support program for local people.

Sino-Russian relations are also an important factor. Both countries are equally interested in protecting wild populations of Amur tigers. Expanded tiger distribution will naturally serve not only to stabilize their numbers, but will also facilitate a certain growth in their numbers. This should be a starting point for developing agreements, decisions, legal acts, and concrete activities. The ideal approach is to:

- a) develop and sign an inter-governmental framework agreement;
- b) distribute work plans to respective provinces and krajs for discussion and comment;
- c) adopt agreements at the provincial/krai level;
- d) prepare a territory in northern China for tiger resettlement;
- e) establish international protected territories;
- f) adopt inter-governmental legal acts;
- g) restock territories with tigers.

### **C. Territorial**

At the territorial level there are many issues, such as a need to:

- a) prepare territories by first removing snares, traps and other devices used to capture tigers;
- b) restore the tiger's prey base;
- c) strengthen anti-poaching activities;
- d) monitor wildlife populations that serve as the tiger's prey;
- e) adopt provincial laws and other legal instruments governing these issues;
- f) work with local people to develop environmental education and compensation programs;
- g) establish internationally protected ecological corridors.

A clear sequence of events, both at the inter-governmental and inter-regional levels, must be agreed to ahead of time. The Chinese provinces and the Russian krajs mentioned need to agree to a cooperative approach that mandates a plan to:

- a) develop and adopt an Agreement for Recovery Measures for Wild Tiger Populations;
- b) prepare the territory in north China;
- c) develop projects to establish international protected territories;
- d) establish international protected territories;
- e) repopulate north Chinese territories with tigers;

f) monitor wild tiger populations.

A broad spectrum of private and government organizations will undoubtedly participate in the implementation of such a plan. It will also be important to consider beforehand the sequence of activities for “introduction” of a recovery plan. There is no doubt that the scientific community must be the first to examine this question. Government agencies must get involved only after an international commission has had a chance to examine and draw conclusions for the plan. Meanwhile, it is essential to continue to monitor tigers and to promote environmental education programs.

## **SESSION 4: POACHING: THE PROBLEM AND POTENTIAL SOLUTIONS**

### **Introduction to Session 4.**

Tiger poaching is considered one of the most severe and immediate threats to tigers in any country where they still exist. Poaching of tigers is encouraged by some combination of 3 factors: 1) the potential profit derived from sale of skins and body parts; 2) the perceived competition for food (i.e. wild deer meat) by hunters; 3) the conflict that arises from depredations of domestic and semi-domestic animals. Of these, the demand for tiger parts for Traditional Chinese medicines is probably the greatest factor. No matter the reason, poaching is the most immediate threat to tigers across their range, and it is unlikely that China is any different. In the early 1990's, it was estimated that as many as 60 tigers per year were being poached in Russia, largely to supply to demand for tiger bone (see Section 9). Since implementation of an anti-poaching program (see article by Zubtsov in this section) the estimates for poaching incidents have dropped dramatically.

In China, where tigers are so rare, the loss of a single individual could have tragic consequences, especially if it were a breeding female. There must be a means to address the threat of poaching set in place as a recovery program is initiated. The intent of this session was to discuss potential strategies for development of such a strategy.

## **CURRENT ATTEMPTS TO BAN ILLEGAL HUNTING IN HEILONGJIANG PROVINCE OF CHINA**

Cui Guangfan  
Heilongjiang Forestry Department, Harbin

Dear Chairman, Ladies and Gentlemen:

It is my honor to attend this international symposium "To Develop a Recovery Plan for the Wild Amur Tiger Population in Northeast China" held in Harbin, China. Anti-poaching efforts intended to save the Amur Tiger are not the work of one country alone, but are the duty of all the world. Anti-poaching is a complex, multifaceted issue that address human ethics, economics, trade, environmental protection, and the use of natural resources. Anti-poaching activities are not just an issue of human protection of wildlife and their habitat, but also of finding a way for humans to live together with animals. It reflects the level of a country's social civilization.

China's best habitat for Amur tigers is in Heilongjiang Province. Tiger habitat has continued to decline in the past several decades because of intensive timber harvest. Xiaoxinganling, a famous forest area in China, now has no tigers; and currently the Amur tiger is found only in Wandashan, Zhangguangcailing, and Laoyeling - eastern portions of Heilongjiang Province - where its population numbers are very low.

A 1970 survey found 81 tigers in the entire Province, and in the 1990s, the number dropped to ten. This is a reason why anti-poaching efforts and habitat restoration for the Amur tiger are urgent matters.

Both the national and the local government in Heilongjiang Province, along with wildlife research and protection organizations, pay great attention to protecting endangered wildlife, including the Amur Tiger.

### **Measures need to protect the Amur tiger.**

#### **1. Improve wildlife protection laws and regulations, and take strong measures against illegal poaching activities.**

Both the central Chinese government and the Heilongjiang Province began to adopt laws and regulations, such as "China Terrestrial Wildlife Protection Law," and "Heilongjiang Province Wildlife Protection Law" in the late 1980s. At the same time, the Amur tiger was listed on the Chinese rare and endangered species list. With the passage of this law, only one poaching incident occurred in the Wandashan forest area of Heilongjiang Province and three local men who killed a tiger were punished according to law. Although Amur tigers have several times attacked local people and livestock in the last ten years, no tigers were hunted. Winter is the most intense hunting season for local people in Heilongjiang Province and some unlawful hunting could have easily occurred during this period. All wildlife management departments have adapted several effective methods to prevent illegal hunting, to great success.

The "Decree Banning Trade in Rhinoceros Horn and Tiger Bone" issued by the Chinese Government in 29<sup>th</sup>, May 1993, forbade all trade in tiger bone in Heilongjiang Province. In the summer of 1994, a smuggling case involving two sets of tiger bone and two tiger skins was uncovered. Four smugglers were punished according to law.

#### **2. Establishing nature reserve for Amur Tigers**

In the early 1980s, two nature reserves, located in the eastern portion of our province, were established after approval by the Heilongjiang provincial government. One is the "Qixinglazi Nature Reserve," which is over 30,000 ha. The other is the "Jingbohu Nature Reserve," which is

over 120,000 ha. We do not know if they currently contain tigers. We plan to establish additional nature reserves.

### **3. Providing education to local people**

Anti-poaching activities require that local people work together, and educating local people is a very important aspect of wildlife conservation. Since the 1980s, we have tried several methods to broaden people's conservation knowledge, such as "Bird Love Week" each spring and "Wildlife Protection Month" each winter. Education programs to teach young people about how to live with animals are run in elementary and middle schools. Increasing numbers of wildlife protection programs have aired on TV and radio, and printed in newspapers, increasing the number of people aware of regional wildlife education efforts.

The great flood that occurred along the Changjiang (Yangtze River), Songhuajiang and Nunjiang Rivers in 1998 was a terrible disaster for China. These floods forced people to again realize the importance of protecting forests. There is now a ban on harvesting virgin forests anywhere in China and this ban is another opportunity to more effectively protect Amur tiger habitat. I believe we have an opportunity to once again hear the roar of the Amur Tiger in the vast forest reserves of Heilongjiang Province in the not so distant future.

## POACHING AND ANTI-POACHING ACTIVITIES

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The results of various wildlife surveys indicate that in recent decades, most wild animals with economic value have declined in number, and with the exception of some species, many have become rare. Aside from logging, an increase in human population and other forms of development, over-hunting has been both a direct and indirect factor in this decline. The Chinese government has passed several laws and regulations to fight poaching. The “National Protected Wild Animal List” has been repeatedly updated. The “National Wild Animal Protection Law” (1988) and the “Heilongjiang Wild Animal Protection Regulation” (1996) have helped to push the wildlife conservation agenda forward.

However, as with other criminal activities, poaching is still a problem that we must address. People hunt wild animals for their skins, for medicine and sometimes even for food. Traditional Chinese Medicine is an animal-based, tradition thousand of years old. It makes medicines from tiger bone, leopard bone, deer antler, deer penis, deer placenta, bear gallbladder and musk and these medicines have always been expensive. Driven by the profit motive, some people are willing to risk breaking the law.

In November 1989, in Jiaohe county, Jilin province, three villagers shot a female Amur tiger dead in Qingshan Forestry station. This sparked a debate on poaching and hunting rifles. In the mid 1990s, all civilian guns in Heilongjiang were confiscated by the government and hence, armed poaching was successfully stopped. But other hunting devices (snares, leg traps, pits) continue to damage wildlife populations. Snares are extremely dangerous to large animals because it is very difficult to detect them. During the 1999 joint survey, 16 snares were found on a routine road of Tuoyang Forestry Bureau. Those snares were set to capture large and middle-sized animals such as roe and wild boar. Tigers fall into these traps as they chase prey. In the winter of 1995, an Amur tiger was caught in a wild boar snare and died at the Wupao Forestry Station of Yingchun Forestry Bureau. It is still common for wild boars and roe deer to be caught in snare.

Poaching damages wild animal populations in several ways. The most direct effect is to reduce population numbers. When the decline reaches to a certain level, self-recovery for the population becomes a problem. Further, poaching destroys the natural structure of wild populations, for example, targeting male deer for their antlers. This alters the sex ratio and age structure. If the animal happens to be prey of another carnivore, then both species are threatened. Some wild animals are forced to abandon their natural habitat to avoid poachers. Current data shows that poachers attack not only commercial grade animals, they also go after birds and reptiles. Human caused disruptions in animal density distorts the balance of natural systems, all this for the short-term revenue derived from the poaching.

Anti-poaching activities have a long way to go to achieve the desired effects. To date we have achieved strict management and enforcement of relevant laws, such as the “Wild Animal Protection Law” and the “Terrestrial Wild Animal Protection Regulation.”

Further recommendations are:

1. Effective use of the mass media to promote wildlife conservation and anti-poaching awareness.

These programs should include:

- a) the significance of protecting wildlife;
- b) a description of which animals are protected by the law;
- c) information on the punishments for breaking the law;
- d) case studies of previous poaching activities.

2. Set up a wildlife conservation network, with a particular emphasis on public involvement.

3. Establish a professional anti-poaching patrol team.

4. Prosecute all forms of poaching and punish violators according to the laws

We believe that poaching can be successfully controlled through comprehensive public education and strict management.

## CURRENT STATUS OF ANTI-POACHING MEASURES IN JILIN PROVINCE

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In order to protect wildlife like the Amur tiger, the Far East Leopard, and other endangered species, the 22<sup>nd</sup> meeting of Standing Committee of People's Representative Congress of Jilin Province (SCPRCJP) passed a "Decision for a Five Year Ban on Hunting Wild Animals in Jilin Province (HF)" in 1996 and made a decision to check the work once a year. In August 1997, the 58<sup>th</sup> Standing Committee of Jilin Province considered and passed "Several Regulations Administrating a Ban on Hunting Wild Animals in Jilin Province," and implemented some monitoring steps further. Since carrying out the HF, wildlife conservation measures have had specific impacts. We have, in general, reached the goal of instituting the ban in the first year, of further consolidation in the second year, standardized management in the third year and wildlife development in the fourth and fifth years.

There are four aspects to the program.

### ***1. Strengthening lead organizations, stressing assignment of duties to implement the HF.***

We designated group leaders at various levels from among people in the province for the HF, making the governor, mayor and county head leader, the leading cadre of forestry, public security, industry and commerce, supply and marketing and environment protection as members. We signed the duty form from the 1<sup>st</sup> year through provincial to local responsible agencies. If any wildlife hunting occurs during the five years, responsible parties will be punished.

***2. Conservation education efforts to raise the environmental consciousness of the citizenry.*** Various promotion activities were used: "Bird Appreciation Week," "World Environment Day," "Wildlife Conservation Month." We drove propaganda vehicles, posted notices, distributed leaflets, and held exhibits to promote the aims and objectives. Using TV broadcasts and newspapers to promote the awareness of the hunting ban, conservation education efforts were broadened. The result was increased conservation and legal understandings among the populace.

***3. Enforcing strict conservation regimes, increasing verification and accelerated reproduction and sustainable development of wildlife.*** The Provincial People's representative Committee verified implementation of the HF, making checks from November through January. Verifications were made by a group consisting of related agencies under the lead of members of the SCPRCJP. We also enlarged the force to monitor and protect wildlife. Since issuing and carrying out the HF, wildlife destruction cases have been investigated and handled; 715 people who violated the law and regulations have been punished; 104,000 hunting rifles have been confiscated and stored; 789 bird nets and other traps have been confiscated, and 6,259 hunted animals have been confiscated. A total of 5,100 birds have been released.

***4. Setting up a reporting and supervisory system.*** Forest managers at different levels have all set up reporting and supervisory telephone numbers and have provided the public with information about ways to report violations. We dealt with reported problems by assuring people that the issue will be handled as quickly as possible and in confidence. We have also worked with reporters and provided awards to shift peoples' attitudes on wildlife conservation.

Although the period for the hunting ban was short, there are apparent effects. First, wildlife resources have increased. Data shows that both the distribution and numbers of many species, including roe deer, wild boar, hazel grouse, pheasant and hare, have clearly increased. Some rare and endangered species like black bear, lynx, and sika deer have begun to reappear. Secondly, wildlife conservation is now a conscious activity for government agencies at different levels. In January 1998, the case of a tiger killing cattle caused a sensation in Huangsongdian, Jiaohe city. According to "National Wildlife Conservation Law" and some related provincial rules, the government paid appropriate compensation to the local farmer and this had a strong international

echo. In another case, when a tiger killed a horse in Jiaohe in May 1999, the local government timely organized related agencies to investigate and the paid compensation to the farmers. Finally, we have gathered some information that will support continuing the ban on hunting wildlife into the future.

## ANTI-POACHING MEASURES IN PRIMORSKII KRAI

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### I. Introduction

A unique array of wild conditions exists within Primorskii Krai. The animal and plant communities in the region include such world famous species as the Amur tiger, the Far Eastern leopard, the brown bear, all species listed by CITES. These species are, however, being wiped out, through poaching, in part due to the proximity of Primorskii Krai to Asian countries and the current economic downturn in Russia. To combat a growing criminal market for biological resources, in February 1994, as part of the Primorskii Krai branch of the RF Committee on Ecology, a specialized department was established to protect rare and endangered animals and plants, including the Amur tiger. The department was created with the technical and financial support of the Global Survival Network (GSN), World Wide Fund for Nature (WWF), and the Tiger Trust.

In 1999, the Tiger Department was reorganized into mobile inspection teams to protect the Amur tiger and other rare and endangered plant and animal species. The teams were named Inspection "Tiger." These changes, approved at the Federal level, followed from a RF Decree, No. 795, issued on August 7, 1995, on "Protecting the Amur Tiger and Other Rare and Endangered Animal and Plant Species in Primorskii and Khabarovskii Krai." This was followed by approval of a Federal Target Program: "Protection of the Amur Tiger and its Habitat," that, in essence, is a national action plan. Substantial support for Inspection "Tiger" is provided by GSN, in its new form, WildAid, WWF, and the environmental funds of both the RF and Primorskii Krai.

Inspection "Tiger" currently has eight mobile teams, including a specialized team called "Kedr" whose task is to investigate illegal timber harvest. There is also an interagency task force to coordinate biodiversity protection activities among specially empowered agencies and law enforcement departments. Each group is assigned a specific area of responsibility, including patrolling several administrative regions of Primorskii Krai.

Inspectors come from the staff of the Primorskii Krai Committee on Ecology. They wear specially designed uniforms and badges, carry weapons and special equipment, use all-terrain vehicles, and have access to both short and long-range communications equipment. The inspectors enforce environmental protection law that protects biodiversity - plants and animals, including marine resources - across all of Primorskii Krai. Inspection "Tiger" is the only group in the Russian Federation that has the authority to carry out a full range of environmental protection measures and that works as an environmental police force. Inspection "Tiger" has uncovered hundreds of infractions of environmental law, detained poachers, confiscated around 700 weapons, initiated dozens of criminal cases and confiscated more than forty tiger and leopard skins. Inspection "Tiger" closely coordinates its activities with all law-enforcement agencies operating in Primorskii Krai.

### II. Primary Activities

The prime objective of Inspection "Tiger" is to protect biodiversity in Primorskii Krai. Accordingly, Inspection "Tiger" works to:

- a) Carry out control and inspection patrols in Primorskii Krai;
- b) Fight poaching;
- c) Block channels for the illegal trade in tigers, in their body parts, and in the products produced from these parts;

- d) Prevent destruction of tiger and leopard habitat;
- e) Maintain a rapid response capacity to deal with “conflict tiger” situations;
- f) Promote environmental education activities among local people
- g) Advertise rules of behavior for people living in tiger and leopard habitat;
- h) Collect information and data on the environment.

In addition to enforcing environmental law, Inspection “Tiger” also produces visual and printed materials, develops legislation and environmental protection rules, and issues permits necessary to: a) assemble zoological collections; and, b) hunt or gather, for scientific, cultural and commercial purposes, plants and animals listed as rare and endangered. Inspection “Tiger” is also responsible for the timely investigation of all situations arising with “conflict” tigers.

## **1. Amur Tiger Protection**

The Amur tiger is included in the Russian Federation Red Book, in the Primorskii Krai Red Book, at the international level Red Book and, naturally, in Appendix 1 of the CITES list. The following generalizations can be made about trade in tiger products. The structure of the market for illegal skins, bones and tiger by-products has changed significantly from what existed prior to 1993. At that time, smugglers directly purchased skins, bones and by-products from poachers. After the Peoples Republic of China toughened its laws and Inspection “Tiger” was created in 1994, the trade in tiger parts underwent changes. Since possession of a skin is direct evidence of killing a tiger, smugglers have become more clandestine in buying tiger skins and body parts. Demand for tiger bone has not, however, undergone any visible changes. This is because identification of tiger bones requires qualified inspection. Since discovery of bones most often occurs during customs inspection, smugglers face almost no risk since they can insist that the bones belong to a different animal.

There is a new tendency in the tiger trade; the market for tiger by-products has clearly shifted from China to South Korea, though clandestine trade with China continues.

Based on Inspection “Tiger” data, the Korean market for smuggled goods obtains its products through regular, traditional channels and these channels are controlled by a limited number of professional smugglers who are very clandestine and who use modern means of communications and equipment. Close coordination among environmental protection agencies, customs official, the Federal Security Service and internal police, as well as the collaboration of similar structures in China and Korea, is a must to effectively fight the trade. The interagency task force with Inspection “Tiger” is currently looking into ways to make such contacts.

As a result of the control and inspection activities of government inspectors in Inspection “Tiger,” 42 Amur tiger skins were confiscated between 1994 and 2000.

## **2. Far Eastern Leopard Protection**

The Far Eastern leopard, at both the regional and federal levels, is recognized as a subspecies threatened with extinction. At the international level, the species is included Appendix 1 of the CITES list, a species requiring the greatest degree of protection.

Primary Far Eastern leopard habitat in Primorskii Krai is located in Khasanskii Raion. According to data from the 1998 census conducted in southwest Primorskii Krai, the number of Far Eastern leopards does not exceed 40 individuals.

In most instances, the leopard is shot when unexpectedly encountered by hunters poaching ungulates or when it lands in traps set by locals for badger or fox. Inspection “Tiger” confiscated eight Far Eastern leopard skins between 1994 and 2000.

### **3. Protection of Ginseng**

The issue of an illegal, international trade in ginseng roots has recently been a topic of discussion at CITES meetings. In December 1999, a member of Inspection "Tiger" participated in a seminar held in Hong Kong where information the delivery sequence for illegally traded ginseng was provided. Hong Kong is world's leading center for illegal ginseng trade and is where 90% of Russia's wild ginseng is sold. Most of Russia's wild ginseng habitat is in Primorskii Krai. The delivery sequence for illegally harvested ginseng is Ussuriisk (Russia), to Suifenhe (China) to Shanghai, Guanzhou and on to Hong Kong. Experts estimate that the volume of illegally harvested Russian ginseng reached 2,000 kg in 1998, with a market value of 30,000,000 USD. In 1999, the figure was 1,000 kg and a market value of around 15,000,000 USD. Ginseng has been an Appendix II CITES item since 2000.

### **4. Pelts**

Chinese citizens demonstrated an interest in pelts as soon as they appeared in the Russian Far East in 1986. Their activities were identified immediately, but by that time a steady cross border trade in soft goods had developed between Russia and China, making it possible for individuals to take pelts to China. As the Russian soft goods trade grew in volume and as changes in market structures took place, Chinese pelt traders began to take over the Primorski pelt market, gradually turning it into an illegal trade. Given these conditions, Inspection "Tiger" is now actively tracking the situation on the pelt market.

In an attempt to interdict illegal activity, Inspection "Tiger," together with Ussuriisk branches of the internal police (UVD) and the Federal Security Service (FSB), successfully carried out an operation in which 17,647 squirrel skins, 581 weasel, 7 otter, 1 sable, one mink skin were confiscated from a Chinese citizen. According to Inspection "Tiger" information, this person is one of three people who have organized an illegal processing site in Russia. They have now been purchasing and shipping pelts to China for three years. They appear to also be interested in ginseng, musk glands, gall bladders, bear paws, tiger bone and penis. The very fact of purchasing pelts using methods that skirt established government rules and procedures encourages poaching, illegal business activities and defeats attempts to establish sustainable natural resource use principles. The economic value of the poached pelts recently confiscated is 104,000 USD. Inspection "Tiger" estimates that up to 200,000 poached squirrel pelts, with an economic value of 1,680,000 USD, have gone to China.

### **5. Forest Protection**

The Primorskii Krai Amur tiger protection program also includes forest protection as an essential condition in protecting tiger habitat and the habitat of its prey.

Inspection "Tiger" members carry out inspection raids along roads to identify illegal harvest of commercially valuable species, such as Korean pine, oak, and ash. They also regularly inspect regional forest district offices (leskhoz) and timber harvest companies in cooperation with law-enforcement agencies in Primorski Krai and with members of the press.

Beginning in 2000, based on a cooperative agreement with the Primorski Krai Forest Service's aerial surveillance department, the department's airplanes will be used to both identify forest fires and violations of environmental protection law.

### **6. Program - "Conflict Tiger"**

The problem of tiger - human interactions is not new, is very relevant, and is gradually attracting more of the public's attention and is increasingly more often a topic for the press. This is understandable.

The quality of tiger habitat is decreasing due to:

- a) low prey densities, especially of ungulates, the main prey of tigers, resulting from increased economic activity, primarily timber harvest, in tiger habitat;
- b) active human settlement of increasingly more distant regions of the Primorskii taiga;
- c) increased human use of the forest resources: pine nut collection, use of NTFPs, fishing, hunting.

The taiga is now being used year round. This creates new disturbance regimes for the animals living in the taiga, and first of all, for the tiger. This also increases contacts between humans and tigers. This means human behavior needs to be intelligent. And there is also a need to have professionally trained people who are ready to prevent threats to human life and, when possible, to assure that tigers remain alive.

To prevent conflicts between tigers and humans living in areas where there is a possibility for an unexpected appearance of the animal, a special group was created as part of the Inspection "Tiger" program in 1998. More than 110 incidents of a tiger approaching human habitation have been recorded since Inspection "Tiger" was created. All incidents have been thoroughly investigated. Team members remain on the site until there is a full explanation and until the threat to humans has been removed. Since 1996, seven tigers have had to be shot. It is clear that traditional methods that relied on untrained personnel who had neither equipment nor a methodology for dealing with problem tigers, is an irrational approach to dealing with conflict tigers, given modern conditions in the forest. To overcome these problems of the past, Inspection "Tiger" actively searched out interested individuals and organizations to jointly solve the problem of conflict tigers.

A solution was found. With the help of Dale Miquelle, local coordinator of the Russian-American Project "Amur Tiger", and with the support of the Save the Tiger Fund, in Primorskii Krai there is now a project called "Conflict Tiger." A group of six inspectors is poised to rapidly respond to all conflict situations and to make a decision to either scare the tiger off or, if necessary, immobilize the tiger and examine the animal to decide if: a) the animal can be re-released into the wild, b) if it should be transported to a center for rehabilitation for later release into the wild, or c) if it must be put down. The shooting of a tiger is an extreme measure that is based upon a decision that takes into account both the health of the animal at the time of its capture and the real threats the animal presents to humans.

This team also works with local people and the media to explain the aims and techniques and collects video and photographic material to be used in the team's educational programs. When a tiger makes an appearance in a village, the team works with that local population to help them better understand what are appropriate responses in cases of unexpected appearances of tigers.

Because of controversies surrounding tiger - human conflicts, the team makes a special effort to fully document the event and then provide this information to biologists and ecologists to allow them to analyze the material and to include it in statistical surveys of tiger - human conflicts.

Team members regularly take part in professional training, including training in law-enforcement techniques and legal training.

The first experiences clearly illustrated that the strategic objective of the project - to protect as many "conflict" tigers possible - is attainable when there are properly trained specialists who are equipped with tools necessary to handle the conflicts.

The next step in the project, the establishment of a special rehabilitation center for "conflict" tigers, will, in our opinion, significantly simplify the problem. This center will be located in Terneisky Raion where the conflict tiger team has its base.

The success of the project will, in large part, depend upon creating a favorable public opinion of the possibility of safely resolving human - tiger conflicts.

## **7. Environmental Education**

Government inspectors with Inspection “Tiger” conduct educational activities for local people that are aimed at explaining the rules of conduct in tiger territory and how local people should manage their livestock in areas where tigers are known to live. Lectures are provided at schools throughout Primorskii Krai, and photo and video materials are used. Wall and pocket calendars with the logos of the State Committee on Ecology and Inspection “Tiger” are produced annually.

Articles appear in the mass media describing the work of Inspection “Tiger” and providing information on protection of the Amur tiger, the Far Eastern leopard and other rare and endangered animals that are on the verge of extinction. TV programs are aired on environmental protection issues, using the video material that is gathered by the members of Inspection “Tiger.”

## **SESSION 5. FOREST MANAGEMENT AND ITS RELATIONSHIP TO TIGER CONSERVATION**

### **Introduction to Session 5.**

Because tigers reside primarily in forested areas, forest management plans and the variety of uses of forests have major impacts on the well-being of tiger populations that reside in those forests. Logging practices, road building, and the sundry impacts of timber harvest are perhaps of utmost importance because they change the structure of the forest, thus impacting prey populations, and provide greater access to forests via road construction, thus increasing vulnerability of tigers to poaching. Yet, the relationship is not a simple one, and total exclusion of people is not necessary in a variety of cases to insure survival of tigers. Forest management practices can be done in a way that is complementary to tiger conservation.

Secondarily, it is also clear that local people rely on forest resources in innumerable ways – for food items such as berries, fruits, eatable plants, for medicinal plants, for livestock forage, and for building and household supplies. Thus, locking up the forest is an impossibility – it is essential to find ways to protect the environment while meeting the needs of local people. Again, flexible and reasonable forest management policies will be essential.

The new National Forest Protection Project initiated by the Chinese government has the dual possibility of protecting the valuable forests of northeast China, and provides a great boost to recovery of tiger populations in the region. It is therefore necessary for those interested in tiger conservation to fully understand the new Forest Protection Project, and to seek ways to integrate tiger conservation with forest management. An introduction to forest management in northeast China, and the implications of the new forest protection policies, is an important first step towards seeking ways to coordinate goals, objectives, and methodologies.

# THE NATIONAL FOREST PROTECTION PROJECT, FOREST MANAGEMENT AND ITS RELATION TO TIGER CONSERVATION

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Harbin, Heilongjiang

## 1. Preface

The National Forest Protection Project was initiated by the Chinese government as an effort to curb deteriorating ecosystems, protect existing native forest, save endangered species, and maintain the country's biodiversity. Eighteen provinces (including Autonomous Regions and Cities) were involved in the project, including Heilongjiang. The project has successfully increased both the quantity and quality of China's forestry resources and has established a more dynamic forest management mechanism, with greater awareness of sustainable development. The Project addressed four issues:

- 1) Map ecological protection areas consisting of no-logging areas and ecological restoration zones;
- 2) Reduce timber harvest in ecological restoration areas;
- 3) Plant fast-growing, high-yield commercial forests in the commercial forest zones, and
- 4) Take advantage of the abundant natural resources in forests to improve the living condition of local communities.

Adjusting the national protocol to apply the "Forest Protection Project" to local conditions, Heilongjiang Forest Industry Bureau laid out goals, methods and tasks to launch the project within the province. Execution of this project is no doubt good news for the wild animals living in the forest. These steps not only are an important measure in protecting Amur tigers and biodiversity, the project also provides us an opportunity to study the relationship between tigers and the transformation of its natural habitat.

## 2. Biodiversity Protection in State-owned Forests of Heilongjiang Province

Heilongjiang Forest Industry Bureau, as the government agency managing the forest industry in Heilongjiang, has 7,486,000 hectares of forest under its control, which represents 40% of the forest resources in Heilongjiang and 34.3% in the Northeast region of China and Inner Mongolia. These forest lands are distributed east of Songneng Plain, south of Sanjiang Plain, the valleys of Heilongjiang River, Songhua River, Mudan River, Wusuli River and Tuofen River and the mountains of Xiaoxinganling, Zhangguangcailing, Laoyeling and Wandashan. The huge area contains a diverse range of wildlife, including over 2,400 species of plants and 415 species of animals including 76 mammals, 611 birds, 16 reptiles, and 13 amphibians. Over 1,000 wild animal farms were opened in the region to breed sika deer, red deer, and bear. Five natural reserves and three national parks have been established.

## 3. Strategy to save the North China Tiger (Amur Tiger)

### *1) Implement National Forest Protection Project to protect tiger habitat*

Heilongjiang used to be a green land covered with virgin forest. Foreign invaders in the 19th century and the two world wars plundered not only the civilians but also the natural resources, including the forest. The virgin appearance was totally destroyed. After the establishment of People's Republic of China, the government did not pay special attention to forest protection and

instead engaged in exploitation until the 1980's. In 1987, logging volumes dropped dramatically and forest coverage began to recover. A total of 976,000 ha of forest reappeared in Heilongjiang between 1987-1997. In 1999, one year after the National Forest Protection Project was initiated, timber output in Heilongjiang was cut by 10%, and thus, a friendlier environment was created for the tiger.

Further recommendations to protect tiger habitat include:

- 1) Assess achievements and move the National Forest Protection Project forward;
- 2) Shift timber harvest from natural forests to forest plantations;
- 3) Close access to mountain regions to allow for natural reforestation;
- 4) Establish tiger protected areas, and
- 5) Establish "green passageways" - ecological corridors for tigers to immigrate freely between Russia and China.

### ***2) Provide adequate prey for tigers***

Wildlife populations have shrunk with forest deterioration. The following table will give us some idea about the drop:

Table 1. Comparative Survey of Wildlife Populations at State-Owned Forests of Heilongjiang Forest Industry Bureau for the Period 1989 – 1999

Year		North China tiger	Wild boar	Roe deer	Red deer	Weasel	Bear
1989	# animals	12	12,826	60,822	24,148	82,970	3,056
	Density (#/km <sup>2</sup> )	0.0001	0.1166	0.5535			
1999	# animals	5	19,951	61,965	20,067	82,015	1,171
	Density (#/km <sup>2</sup> )	0.00005	0.1814	0.5633			
	Change	-7	7,125	1,083	-4,081	-955	-1885

This table indicates that the tiger population dropped from 12 to 5 in the past ten years, whereas the wild boar and roe deer populations - the tiger primary prey - flourished because of fewer natural enemies. To provide the tiger with adequate food, all forms of hunting must be banned in and around the tiger distribution areas.

### ***3) Scientific surveys and international cooperation***

There are several opinions why there has been a reduction in tiger numbers in China: environment factors, prey, human activities, evolutionary factors in the North China tiger. Scientific surveys need to be conducted to determine key factors. International cooperation in seeking ways to slow the tiger's demise will help the North China tiger survival.

### ***4) Public education and legislation***

The Chinese government has passed several wildlife conservation laws, including: "National Wild Animal Protection Law" (1989), "National Land Wild Animal Protection Regulation," "National Regulation for Nature Reserve." There have also been laws and regulations at local governments levels. But legislation for certain species and certain areas of the north is hardly

enough. These laws and regulations must be widely distributed via a public education campaign to assure that the public "knows the law, studies the law, understands the law and abides by the law."

#### **4. Next Steps**

- 1) Establish the North China tiger Information System
- 2) Field survey and field monitoring techniques for North China tiger
- 3) Define relationship between the National Forest Protect Project and the recovery of the wild population of the North China tiger
- 4) "Gap Analysis" for North China tiger conservation
- 5) Design training materials to train wildlife management staff in Heilongjiang
- 6) Develop a provincial forest management plan, including mechanisms to account for the impact of timber harvest on wild animal populations
- 7) Design and establish North China tiger protected areas
- 8) Design and establish ecological corridors in the border areas between Russia and China

## **SESSION 6. MONITORING THE TIGER POPULATION IN NORTHEAST CHINA**

### **Introduction to Session 6.**

The Amur tiger is one of rarest large mammals on Earth. At present its numbers are decreasing and its habitat is becoming fragmented. The combination of its rarity, sparse distribution, and secretive nature make it a particularly difficult animal to count reliably, and the financial burden and logistical constraints make range-wide surveys on a yearly basis practically impossible to conduct and successfully monitor changes in tiger abundance. Nonetheless, without an accurate monitoring program that can determine trends in tiger numbers, the ultimate effect of tiger conservation programs will remain unknown.

Methods for a monitoring program in Russia have already been developed, and monitoring has been in place since the 1997 - 1998 winter. However, methods that are in place in Russia, where there exists a relatively stable, reproducing population, are inappropriate to detect the small numbers of animals that are dispersed across the vast forests of Jilin and Heilongjiang. Surveys, such as those conducted in 1998 and 1999 in Jilin and Heilongjiang, help provide a basis for understanding the status of tigers in those regions, but are relatively expensive and cumbersome as a monitoring tool.

Nonetheless, it is critical that yearly information provides a basis for determining the trends in tiger numbers. Without a standardized monitoring system in place that is conducted on a yearly basis, a basis for determining the effects of imposed management plans will not exist.

Therefore, an important part of any action plan will be the initiation of a program to determine changes in tiger numbers, and their prey, as management plans for tiger recovery are initiated.

# A MONITORING PROGRAM FOR AMUR TIGERS IN HEILONGJIANG PROVINCE

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A survey on Amur tigers was conducted by an international team (Chinese, American and Russian specialists) in eastern Heilongjiang Province in 1999. The results showed that distribution of tigers in Heilongjiang has obviously shrunk since the early 1990's. The greatest evidence of tigers existed in Eastern Wandashan and Southern Laoyeling. Five to seven tigers were counted in eastern Heilongjiang in the 1999 winter, and most appear to exist largely as nomadic and isolated individuals. The data suggest that there is no longer a resident, stable population anywhere in Heilongjiang, with the possible exception of the Eastern Wandashan. In concert with results from Jilin, we conclude that the Amur tiger is on the verge of extinction in China, and that it is presently sustained by emigration of individuals from Russia. However, the data indicated that there exist suitable habitat that could support prey populations and tigers in Heilongjiang, specifically, 2000 km<sup>2</sup> in Eastern Wandashan and 1200 km<sup>2</sup> in Southern Laoyeling. We believe that extinction of tigers in Heilongjiang can only be averted if an immediate and long-term commitment is made to conservation of this subspecies in the wild.

It is quite evident that developing a monitoring program should be an important step and component of a recovery plan for the wild Amur tiger population. It may offer some scientific information for developing a recovery plan, and to assess the success of the recovery efforts. Since 1997, Russia has been developing a monitoring program for Amur tigers, and has important results. It is necessary to develop a means of monitoring changes in the tiger, prey population, and habitat immediately across Heilongjiang Province.

## **Goals**

The ultimate goal of this program is the development of an information network to monitor changes in tiger, prey population and habitat within the range of current tiger distribution in Heilongjiang Province. The intent is to provide a mechanism that will assess changes in the density of tigers over long periods of time, provide a means of assessing the effectiveness of current management programs, and provide an "early warning system" in the event of rapid decreases in tiger numbers.

## **Main Contents of the Monitoring Program**

1. To monitor changes of tiger distribution in Heilongjiang Province;
2. To monitor changes of tiger numbers in Heilongjiang;
3. To monitor ratio of adult-young tigers and sex ratio in Heilongjiang;
4. To monitor changes of prey abundance in current tiger ranges;
5. To monitor changes in habitat quality in Heilongjiang;
6. To determine the concrete location of tiger ecological corridors in Chinese-Russian border area.

## Monitoring Methods

### 1. Identification of monitoring regions

The following 11 monitoring regions were identified on basis of current tiger distribution status.

Table 1. List of monitoring regions based on current tiger distribution.

Eastern Wandashan	Southern Laoyeling	Northern Laoyeling	Northern Zhangguangcailing
1. Dongfanghong	4. South Suiyang	6. North Suiyang	9. West Dongjingcheng
2. Yingchun	5. Muling	7. Bamiantong	10. West Dahailin
3. Raohe		8. Jidong	11. Ningan County

### 2. Determining monitoring units

Thirty-five forest districts in which evidence of tigers was found in recent years were selected as monitoring units.

### 3. Monitoring personnel

The monitoring personnel include specialists and local people.

Every specialist is responsible for one or two monitoring units, for supervising local monitoring personnel, and to conduct interviews in potential habitat nearby monitoring regions.

One local resident was recruited as a monitoring personnel for each monitoring unit. These individuals, who are selected for their experience in the forest and their trustworthiness, take charge of monitoring activities.

### 4. Training

The local monitoring personnel must be trained in route selection, track identification, methods for measuring and recording sign, keeping sign, and collecting information from local citizens about tigers.

### 5. Collecting data

Tiger signs: Date, location, PPW (front pad width), track length and width, track direction, age of sign, and habitat type.

Ungulate tracks: to develop survey route, record number of fresh tracks (less than 24 hours old) and snares. Main ungulates include wild boar, roe deer and red deer (elk).

Habitat changes: Collect and record the data of illegal hunting (species, number, site and date), logging activity, forest fire and important land use action etc.

Table 2. Units selected for inclusion to Heilongjiang Tiger Monitoring Program.

Area	Forest Bureau/Area	Forest District
Eastern Wandashan	Dongfanghong	Qingshan, Qiyuan, Wulindong, Hekou, Yongxing, Dadai, Dumuhe Maohe
	Yingchun	Wupao Sanxinshan,
	Raohe	Xilinzi, Xiaonanhe, Xitong
Southern Laoyeling	South Suiyang	Sanchahe, Nuanquanhe Zhongguliu, Sanjiang lazi Hanconggou, Liu
	Muling	Daimagou, Huamu Gonghe, Longzhaogou
Northern Laoyeling	North Suiyang	Shuangqiaozi
	Bamiantong	Laoheishan, Haiyuan, Erianghe
	Jidong Sishan	
Southern Zhangguangcailing	West Dongjingcheng	Erzhanyi, Erzhaner, Erzhansan, Beigou
	West Dahailin	Qifeng, Liuhe, Qianjin,
	Ningan County Xiaobeihu reserve	

## **SESSION 7. COMPENSATION FOR LIVESTOCK DEPREDATION BY TIGERS AND LEOPARDS**

### **Introduction to Session 7.**

Poaching of tigers is encouraged by some combination of 3 factors: 1) the potential profit derived from skins and body parts; 2) the perceived competition for food (i.e. wild deer meat) by hunters; 3) the conflict that arises from depredations of domestic and semi-domestic animals.

A successful anti-poaching program must address all three factors that lead to tiger poaching. Of these three reasons for killing tigers, compensation for depredation losses appears to be the one which can be most readily and quickly addressed. Most depredations occur on cattle, horses, and dogs, and most of the burden falls on local people who cannot afford the loss of valuable livestock.

Depredation is not a problem unique to northeast China, or to tigers in general. Where ever large carnivores and humans share the landscape, there are bound to be encounters, and these often take the form of predators killing livestock. A number of solutions have been found in various countries, with varying degrees of success. Appropriate programs depend on the extent of the problem, and the extent to which local people perceive the issue as a problem.

Assuming tigers are going to recovery in northeast China, it is almost guaranteed that there will be an increase in depredations by tigers. A successful recovery plan will already have a depredation compensation program in place to avoid unnecessary backlash from local people upset with increasing losses of livestock to tiger predation. Therefore, it is better to be prepared with a depredation program in the early stages of planning. An additional benefit of such a program will be information gained on distribution and occurrence of tigers as depredations are reported.

## **IMPACT OF TIGERS AND LEOPARDS ON LIVESTOCK AND A LIVESTOCK COMPENSATION PROGRAM**

Li Tong  
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Protected wildlife, including tigers and leopards, sometimes cause damage to humans and livestock. Injured people and the owners of damaged livestock often ask for compensation.

There are two main reasons for such accidents. One is that suitable habitat has declined due to human economic activities. The other, and more important reason, is a shortage of prey; tigers and leopards enter areas where people live and work to forage and eat livestock. Another reason is that humans walk the mountains and graze stock in tiger habitat.

We need to develop tiger and leopard reserves and undertake bio-technical and engineering steps to defend and improve its prey. One step is to request that local people not graze livestock in these areas. Local wildlife management agencies must investigate and verify conflict situations. The government must verify incidents and determine if compensation is necessary.

Our Province currently has no specific compensation procedure for dealing with such conflicts. Incidents have occurred in Hunchun and Jiaohe and those local governments have developed compensation programs.

For example, in January 1998, a tiger killed four cows grazing freely in the forest by four farmers of Shuangshan Huangsongdian Jiaohe city. The loss was estimated at 5,345 yuan. Jiaohe government issued documents on November 1, 1998 and paid a total of 3,741 yuan: 770, 945, 976, 1,050 yuan to each of the four farmers, this amount representing 70% of the value of the livestock. The city government also issued a government document No 78, 1998: "Jiaohe City Government Notice to Improve Livestock Control to Avoid Damage by Tigers" that were distributed to townships.

In mid May 1999, Wang Jianqin, a farmer, sent his horses into the forest. Two were killed and one wounded, causing a loss of 3,290 yuan. Despite the fact that the government had already issued its notice, it decided to provide compensation to encourage people to protect tigers; the government paid 30% of the value to Wang. It also issued "Jiaohe Peoples Government Administration Compensation Decision" to replace the earlier document.

Based on experience in compensating for loss of livestock by tigers and leopards, and the need for improving their protection, the Jilin Forest Department is going to draw up a compensation measure for livestock injured by tigers and leopards. The basic measure is to establish tiger and leopard reserves, to then investigate and study the depredation incidents, setup an inspection team and finally, pay reasonable compensation. Primary sources of compensation funds are: 1) local government disaster relief fund; 2) wildlife protection and use charges; 3) support from international groups working on tiger and leopard conservation project.

In short, when carrying out wildlife conservation laws, we must adequately address the impact of tigers and leopards on livestock, pay attention to the needs of people, and encourage them to improve conservation efforts.

## A COMPENSATION PROGRAM IN KHASAN RAION, RUSSIAN FAR EAST

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and

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In the summer of 1999, a compensation program was started in Khasansky Raion in the Russian Far East. Khasan is a relatively small district, west of Vladivostok. It borders on the Jilin Province in China. Most of the remaining Amur leopards live in Khasan. Khasan also holds a small population of Siberian tigers.

Tigris Foundation finances the compensation program and took the initiative to start it. The program is administered by Phoenix Fund in Vladivostok. The field work is carried out by the members of the Inspection Tiger anti-poaching team that operates in Khasan.

All farmers in Khasan can receive compensation when livestock are killed by leopards or tigers. However, the program focuses on a few large deer farms in Khasan where most of the livestock kills occur. On these farms, sika deer are raised for their antlers, which are used in Traditional Asian Medicines.

### 1. Goals

The goals of the program are:

- a) prevent killing of tigers and leopards;
- b) increase support for conservation;
- c) collect data on ecology of tigers and leopards; and,
- d) create fairness.

We hope that compensation will prevent retaliations by the farm staff when tigers or leopards kill livestock. We also hope that it will increase the support from the local population for nature conservation in Khasan.

The compensation program provides useful data about leopards and tigers, such as:

- places where leopards and tigers occur;
- hunting methods used by leopards and tigers on deer farms;
- prey preferences of leopards and tigers at farms (age, sex of deer killed);
- the importance of livestock as a food supply in comparison to wild prey;

The compensation program creates an element of fairness by ensuring that the burden of conservation is not carried entirely by the local people that live in the vicinity of tigers and leopards.

### 2. Type of compensations

The program in Khasan provides different types of compensations:

- a) farms receive financial compensation for livestock kills;

- b) deer farms receive additional financial compensation for the presence of tigers and leopards on or near the farm;
- c) deer farms receive practical assistance, such as:
  - deer fodder in case deer cannot eat grass due to a thick or hard snow cover;
  - petrol and repairs for a truck that transports deer fodder;
  - payment for building a shed to protect deer fawns.

Paying for the presence of tigers and leopards creates a further incentive for local farmers to tolerate these large predators. The presence of leopards and tigers is established during counts in winter when there is a snow cover. In 2000, we have paid for the presence of 2 leopards near a deer farm. The presence of these leopards was established during a leopard and tiger count that was held in Khasan in February 2000.

### **3. Organizational aspects**

The program operates as follows. Farm staff contacts the local Inspection Tiger anti-poaching team when they discover the remains of livestock that have been killed by a leopard or tiger. The team can be reached for this purpose 24 hours a day by telephone. The reported kill is checked by an inspector from the team within 24 hours. In most cases it is possible to establish if livestock have indeed been killed by a tiger or leopard by examining signs such as tracks, hair and wounds on the body of the killed animal. When it is established that the animal was indeed killed by a tiger or leopard, the inspector and farm staff agree on the value of the animal that has been killed. They then draw up and sign a statement that describes details of the livestock kill such as the date, place and circumstances and the compensation that was agreed. Copies of the statement are sent to Inspection Tiger and to Phoenix Fund. A few times a year, Inspection Tiger inspectors who work outside Khasan will travel to Khasan to check the information that is provided in a statement. When Phoenix receives a statement, they pay the compensation with funds that are provided by Tigris Foundation.

Deer farms that want to become eligible for compensation have to sign an agreement with Phoenix. This agreement states, among other things, that the farm staff will not take actions that can harm tigers or leopards, that they will report all available information about activities of tigers, leopards and poachers, that inspectors of the anti-poaching teams are allowed free access to the farm grounds, and that the staff will leave livestock kills undisturbed after they have found them.

### **4. Actual kills and compensations**

Between September 1999 and November 2000 a total of 24 deer, 1 horse and 1 cow calf were reported killed by leopards and tigers in Khasan. All kills, except the horse, occurred on deer farms. Compensation payments of USD \$1,360, - were made for the livestock kills. A total of USD \$1,120 was paid between May and November 2000 for the presence of 2 leopards near a deer farm (USD \$80 per month per leopard).

### **5. Recommendations**

Tigris Foundations and Phoenix Fund would like to present the following suggestions to those who are considering a compensation program for livestock kills by tigers and leopards:

Farmers may believe that the number of livestock kills is higher than it is in reality. As a result a compensation program can have positive effects on the popularity of conservation, even if the actual number of livestock kills is very low.

To increase the positive effect of a compensation program, it should be promoted. This promotion can include: articles in local newspapers, announcements on boards in official buildings and signs with information about the program along roads. The operators of the program should

make sure that compensation payments receive attention in local media such as newspapers and local television channels.

In order to prevent corruption, field work and payments should NOT be the responsibilities of the same person. Preferably, they should be carried out by different organizations.

The staff that checks reported livestock kills should work with a standard form on which all relevant information concerning the kill can be filled in.

In China compensation for the presence of tigers and leopards close to small villages inside or close to reserves may be considered.

## **APPROACHES TO REDUCING LARGE PREDATOR AND HUMAN CONFLICTS**

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Compensation for damages is one of the most crucial issues in the conflict between large predators and humans. There are two possible solutions to this problem: 1) to provide a damage payment to a farmer for losses incurred from a wild animal's attack; or, 2) make no compensation but simply be aware of the attacks.

Research conducted in Russia shows that almost 60% of those people whose livestock has been killed want their satisfaction in the form of a tiger or leopard skin. The remaining 40% prefer to receive monetary compensation. Unfortunately, in Russia, as a rule, most conflicts are only noted, and in the best of cases there is an attempt to scare the predator off before new attacks occur. The absence of any form of government policy to compensate for losses has an extremely destructive impact on preserving large predator populations.

Only conservation organizations are currently providing small amounts of money to pay compensation in the event of an attack.

The Worldwide Fund for Nature (WWF) has also gained some experience in Russia in developing approaches to solving the issue of reducing conflicts with wild animals. At the current time it is conducting an experiment in the Altai to insure livestock from snow leopard attacks. Fifty thousand heads of livestock have been insured for 1,000,000 USD. To make sure that it has been a snow leopard attack and not some other animal, farmers were issued disposable cameras. At a particular point in the project, snow leopard specialists examined the photos to determine whether or not to continue the experiment.

In the conditions found in northern China, where we are talking about isolated predator attacks, there is no doubt that compensation should be paid. I believe that the compensation program should immediately carry government status. This is especially the case, given that the damage is minimal.

The response time to a conflict situation is a key element in predator attacks. Russia has a developed network of anti-poaching teams, including ones created by WWF, that are capable of very quickly making their way to the scene to take appropriate action. A special group called "Conflict Tiger" operates in such a way that, when the situation calls for it, they can decide whether or not to immobilize an animal.

There is an urgent need to immediately establish in northern China a special system of tiger and leopard protection that strives to minimize conflicts between these animals and humans.

Experience gained in Russia makes our Chinese colleagues' task of successfully solving the problem of protecting wild populations of Amur tigers and Far Eastern leopards in northern China simpler.

## **SESSION 8. PUBLIC EDUCATION**

### **Introduction to Session 8.**

It is clear that the survival of tigers is becoming increasingly linked to their relationship to people. On the one hand, the tiger is a potent cultural symbol, often with courageous and heroic characteristics, but the reality of the relationship of local people and tigers is often very different. The potential value of tiger skins and parts, the negative impact of livestock depredation, and the fear of potential man-killing often result in local people having a much less “glamorous” perspective on the animal with which they share the forests. Nonetheless, it has become increasingly clear that survival of tigers is ultimately dependent on establishment of a workable relationship with local people. Oftentimes the key ingredient to developing this relationship is public education.

Public education can also have an important effect at the national level. By creating a new understanding of the plight of tigers, there can be a shift in national policies, and a strengthening of laws for tiger protection. Similarly, an understanding of the threats to tigers can result in new ways for users and practitioners of traditional Chinese medicine to adjust their needs, and greatly reduce the demand for tiger products. As this is one of the key long term threats to tiger conservation across the world, public education should be a cornerstone of a tiger action plan.

## **PUBLIC EDUCATION – AN IMPORTANT COMPONENT OF TIGER CONSERVATION**

Endi Zhang  
Wildlife Conservation Society

**Abstract.** The tiger is threatened throughout its range by habitat fragmentation and destruction, loss of prey and poaching. The demand for tiger products, especially bone, used in traditional Chinese medicine (TCM) and related products, is one of the major driving forces behind poaching of tigers in many areas. However, a survey of students and practitioners of TCM indicated that the connection between TCM and the tiger's endangered status was largely unknown. The WCS-ACCP was formed to address this gap in awareness, and, since 1996, has been working to raise public awareness and influence patterns of use of endangered wildlife-based products in China as a way to reduce pressures on wild populations.

**Goal:** To reduce the primary threats to tigers and other endangered wildlife in China

### **Program activities:**

#### **1) Influence attitudes and practices of students toward traditional Chinese medicine**

Graduate students and professionals of TCM will continue to be the primary target group for efforts to reduce the use of tiger ingredients in TCM medicines. The students were chosen in particular because they are receptive to new ideas and information, and will soon be licensed doctors issuing prescriptions. A total of eight workshops were held to bring together professors and students of TCM, journalists, and government officials to discuss the status of tigers in the wild and alternatives to prescribing tiger products in medical treatments. To obtain wide media coverage, we have prepared a proceeding from the workshops in Chinese and distributed them to attendees and other interested parties.

#### **2) Educating current and future TCM consumers**

While the TCM practitioner is the focus for reducing the prescription of tiger-based TCM medicines, the consumer is the primary target to reduce the demand. We educate teenagers about wildlife conservation, and challenge them to become actively engaged in promoting conservation among their friends and family members.

#### **3) Raise public awareness about the need to avoid the use of tiger-based products through TV, Internet, prints, talks and exhibits.**

#### **4) Build support for tiger conservation among Chinese government officials and other influential decision makers**

Support for tiger conservation must also be built among government officials and decision-makers, who have the capacity to implement tiger conservation on several fronts. We attempt to provide government officials with literature in the Chinese language on tiger conservation; propagate collaboration with other organizations so that we have a strong voice for implementing change; invite key individuals to TCM workshops and media events; and meet with authorities to discuss new strategies for enforcing already-existing laws.

WCS-ACCP is moving forward on a number of fronts to consolidate the lessons learned from the past four years, and to build a stronger portfolio of projects, which address the need to continue to reduce the demand from consumers and practitioners of TCM.

## PUBLIC EDUCATION AND SIBERIAN TIGER CONSERVATION

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Ladies and gentlemen,

It is my great honor to discuss a specific public education plan for tiger conservation.

Many government and non-government organizations are conducting public education activities to disseminate scientific knowledge and information about relevant laws and rules, and this has had some success. People acknowledge the efforts made to protect cranes, the giant panda, tigers, and the crested ibex. There remain many challenges in conserving endangered species. We must change life styles and coordinate environmental protection efforts.

Industrial development projects continue to ignore potential ecological problems and possible serious impacts. Environmental concerns are ignored in an effort to obtain short-term economic benefits. People are ignorant of their responsibility to the environment. All these problems are disastrous for endangered species. The Siberian tiger, the largest feline in northeast Asia, is experiencing a difficult time in its effort to survive. Large-scale public education is needed to rescue this beautiful predator.

Siberian tigers once roamed all the forests of northeast China. Siberian tiger habitat has been fragmented in the past several decades and rapid human population growth and overharvest of forests has reduced prey numbers. In the 1970s and 1980s, the Siberian tiger disappeared in the Daxing'an and Xiaoxing'an Mountains, respectively. Earlier studies show that the Siberian tiger population declined very sharply. The 1974-1975 survey found 151 tigers, but in 1984-1985 20-30, in 1988-1991, 16-22, with 9-13 in 1998. Current population numbers are below the critical level.

Why has this occurred? Factors include frequent poaching, habitat destruction, and inadequate prey. However, the root of the problem is people. To solve the human problem is to solve the problem of tiger conservation. Philosophically, the problem is that humans consider themselves to be at the center of nature and society in out of tune with nature.

People must use nature for the things of life. Only humans have a tendency to view all things, even potential resources, as belonging to humans only. Humans have a very skewed and dangerous view of nature: humans have priority over all things natural and human benefits take priority over all other benefits. With this view of nature, people extract resources from nature without limits and they ignore the fragility of the natural order. This leads to the destruction of an environment upon which people are dependent for life. Indicative of this attitude is the rate of species destruction; it has increased by a factor of one thousand and we are witnessing an increasing number of ecological disasters. One way out of this crisis is for people to develop a broader view of nature.

This broader view of nature begins with human society developing a sense of the natural system. Humans are a species created by nature and their development cannot exceed the principles upon which the natural world is based. At the same time, humans are part of the natural system from which they arose. Compared to other species, the only difference is the capacity of humans to cover a vast range and have an impact on more species than any previous. This kind of structure enables humans to occupy extensive resources, and at the same time, makes humans responsible to nature. In the past 50 years, with humans beginning to live in Siberian tiger habitat, they have rarely taken into account their responsibility to nature and have emphasized human priorities. This has been a serious mistake. In Yichun area in the Xiaoxing'an Mountains, timber harvest declined by 50% by 1986. Between 1976 to 1986, the ratio of growth and decline was 1:1.96, which means two years of growth, covers only one year of demand. The ecological situation will grow worse and

the wildlife population numbers decline in tiger habitat unless countermeasures are adopted immediately.

## **1. Public Education Issues**

The concept "public" must include both people and government decision-makers.

Government decision-makers are few in numbers but they are responsible for political and economic policy. They must not neglect environmental benefits or intentionally destroy the environment, threaten or eliminate wildlife when making policies and strategies to develop the local economy. Many things are lost in the decision making process in China. The current situation in respect to the Siberian tiger is but one obvious example of poor policy making.

People who make up most of society differ in educational and cultural background. Their environmental consciousness also differs. Environmental education programs are essential to environmental protection ethics. People must know that they are responsible for protecting wildlife, that they are but one of the planet's species, that wildlife is their friend and that this wildlife also deserves to enjoy a free life and that injury to wildlife is injury to human. Only people can protect the Siberian tiger.

The aim of public education is to make both people and decision-makers accept some new concepts, to consider and reflect on the concept of coordinating the development of nature. This will require much work and a lot of time. Public education on Siberian tiger conservation can be done in the following ways.

### **A. Enhance public consciousness of the laws and rules regulating tiger protection**

China is a rule of law nation. Everyone must obey the laws and rules in their lives and work. To protect wildlife and their habitats, international organizations and the Chinese government have made a series of laws and rules. It is very important to let public know of these and to have them comply with them. This can be accomplished through public education. We need to tell people about CITES about the Chinese Wildlife Protection Law and about the consequences of breaking the laws, about the risks of punishment and death connected with poaching and trading in tigers and their parts.

### **B. Disseminate knowledge on Siberian tiger conservation**

The Siberian tiger is the species we are trying to conserve. The public must know that the tiger is on the list of national protected species should be protected. The root of the problem is how to protect the tiger, what should be done, and what must be avoided. Conservation biologists can develop programs, but to successfully implement a program, public concerns about the program, especially when the program conflicts with traditional views and benefits, must be addressed. Strategically, knowledge about the Siberian tiger and its conservation, its biology, ecology, behavior, conservation and culture must be disseminated. Only with this knowledge will people behave correctly.

### **C. Change attitudes on the use and consumption of tiger products**

In traditional Chinese medicine, tiger bone is believed to relieve flatulence and irritation, strengthen tendons and bones, and is effective in curing diseases such as rheumatism, epilepsy, and lumbago. Asian people believe in the medicinal functions of tiger bone. Tiger bone is a very rare invigorant and medicine as well as a symbol of power and status. People value tiger bone much more than other wildlife products. The consequence undoubtedly brings tigers under very intense poaching pressure. Tiger skin, bone, and pennies in return bring very huge benefits to poachers.

The Siberian tiger is the largest subspecies, and its products are naturally in great favor. The rarer the tiger is, the more the poachers benefit, and the higher pressure becomes.

However, the medicinal properties of tiger parts are not as miraculous as advocated and are not the only traditional medicines that address these ills. Studies show that there are other traditional medicines that are a substitute for tiger parts, such as the body of *Myospalax*. Thus, people need to know that tiger parts are not rare bird, but a kind of traditional Chinese medicine with some functions. It is totally unnecessary to spend so much money and even fame to pursue tiger products. Once the consumption mentality is changed, there will not be a large market for tiger products and poaching will drop dramatically. The value of tiger products is a scientific pursuit, and the development and application of substitutes is also something for science. Only thorough, ongoing public education will let the public know the truth and dissuade them of the superstitions surrounding tiger parts.

#### **D. Direct the public toward an integrated understanding of nature**

Besides poaching, another major reason why the tiger is endangered is habitat destruction. The reason why human's destroy tiger habitat is to improve their quality of life and because they neglect to consider the tiger's survival. A key factor is irrational industrial development. A dramatic change in economic practices is not to be expected because local economies are dependent upon current patterns. Forestry is a major industry in tiger habitat. The economy in these areas is dependent upon forest resources.

Many of the forest resources were removed and shipped to other parts of China. Now, 50 years later, forest resources are nearly gone and people must change their ways to earn a living to maintain or improve their quality of life. Rational natural resource use must be based on an understanding of nature's inherent principles and values. Long-term, local economic development also depends on the quality of the natural environment, on the abundance of natural resources and a balanced ecosystem. Public education aims to disseminate knowledge, to assist the government and society in making policy, and strategy decisions that are in keeping with principles and rational development.

## **2. Approaches to public education**

The aim of public education is to convince the public to change or limit irrational natural resource use and lifestyles, based on scientific knowledge and a better understanding of tiger conservation, both directly and indirectly. Strategically, public education on Siberian tiger conservation issues should be carried out using the following principles.

### **A. Be practical and realistic**

Public education should be based on scientific knowledge and not on trade or advertisements. We should tell the public scientific truths instead of exaggeration. The public sees science as genuine, correct and fair. Once public education appears as advertisements or based on pseudoscientific material, the public is less likely to believe in what they are being told.

### **B. Focus on people**

The object of public education is the public. Different parts of society react differently to public education. Some people will react quickly, some will take a while to consider the issues, and a part will reject things outright. We want people to accept change. In selecting an approach to public education, we must consider the issues and analyze the reasons why they respond differently. Ideas are accepted because they coincide with beliefs. Having no direct relationship to the issues can result in a person hesitating and mulling over those issues. A person will reject an idea that is

in conflict with his/her viewpoint or benefits. Public education should operate at various levels. The depth of a person's understanding depends on the level they belong to. In addition, public education must not burden the public so that it comes to accept and understand the ideas and principles with ease. Experience shows that public education is a long-term commitment and hard work.

### **3. Ongoing Public Education Program**

I want to say something about our two-year project - "Public Education on Siberian Tiger Conservation" funded by the Rhinoceros and Tiger Conservation Fund of United States. The National Forestry Bureau Detecting Center of Wild Fauna and Flora received funding this year from the US Rhinoceros and Tiger Conservation Fund, and since Mr. Bagley is in attendance and has done so much to get this project started, I would like to say thank you to him and his colleagues.

#### **A. Project Objectives**

The general objective is to help people understand that their activities should not disturb the natural condition of tiger habitat and should be aimed at improving habitat quality.

The aims of the project are:

1) Let people know the place and function of the tiger in a natural ecosystem. Only when they know something of the ecological background will they have an idea of how the total environment should be protected and what underlies sustainable development.

2) Let people know the correct relationship between the ecosystem and peoples' lives. This is helpful when people discuss development programs.

3) Let people know the laws and rules regulating tigers and environment protection. This knowledge will help shape peoples' life styles and development patterns.

#### **B. Work Plan**

##### ***1) For preschool children***

Publish a cartoon picture book with twenty stories about various kinds of animals in forest ecosystems. The stories should tell a story about the food chain and the animal's struggle for existence. The picture book will tell the story of why we don't see tigers and many other animals in the wild and what we could do to save them from extinction.

Write and publish a series of children songs about tiger. These songs will be taught at kindergartens in northeast China.

##### ***2) For primary school and middle school children***

Publish a picture book with the following contents:

- Introduction to tigers and the various subspecies
- Systematic evolution of tiger
- The role of tigers in the ecosystem
- The history and status of the tiger
- Why tigers are endangered and what endangered means
- How to protect tigers
- What we should do now

This book will be introduced to primary schools and middle schools in northeast China, especially in forestry areas.

Organize ten training classes in Heilongjiang and Jilin for middle school biology teachers. Siberian tiger specialists will be invited to give lectures on the following aspects:

- History and present condition of tigers
- Cultural significance of tigers
- Historical use of tiger parts and the negative impact on tiger conservation
- Reasons why we should protect tigers
- The laws protecting tigers in China
- Tiger prey and habitat
- The need to protect and restore tiger habitat
- Successful experiences in tiger conservation around the world
- What needs to be done in China now
- Efforts to conserve tigers in other parts of the world
- Ongoing and needed scientific research on China's Siberian tiger
- The role of tigers in the ecosystem

Organize an intellectual contest of tiger knowledge and conservation on TV.

**3) For other parts of the society**

- a) Publish a column in a popular newspaper on tiger conservation
- b) Organize a propaganda team to publicize tiger protection
- c) Produce tiger posters with a strong conservation message. Distribution will be in towns and villages near remaining tiger habitat.

We are very lucky to live in the native lands of the Siberian tiger and very happy to see so many people who care about Siberian tiger. This project is our first one specifically for Siberian tiger conservation and I believe there are many more projects waiting for us.

Our viewpoint is: Do not lose the Siberian tiger because it belongs to the earth, as well as to future generations. I hope our offspring can live with the Siberian tiger in harmony.

Thanks for your attention.

## **SESSION 9. THE TIGER BONE TRADE IN CHINA**

### **Introduction to Session 9.**

Over the centuries, nearly every part of the tiger has been prescribed as a remedy for innumerable illnesses, all across Asia. These traditional medicines are respected by more than one-fifth of the world's population, and use of these health care remedies has been regarded as an inalienable right for at least a thousand years.

Of all the tiger parts, however, tiger bone is considered the most valuable and is most frequently prescribed as a muscle strengthener and as a treatment for rheumatism. Commerce in patented medicines put millions of units of tiger derivatives into international trade in the three years leading up to China's ban of the use and sale of tiger bone in 1993.

Because the value of tiger bone is so great, there is great incentive to poaching, and by far the majority of poaching is associated with providing products for the trade in tiger bone. Hence, the demand and trade in tiger bone is probably the single greatest short-term threat to survival of tigers in China. Therefore, an understanding of the history of this issue, and how China is managing its tiger bone stockpile, and the ban on trade in tiger bone, is of utmost importance.

## **PROHIBITION OF TRADE IN TIGER BONE AND RELATED ISSUES**

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China is habitat for the Siberian tiger, South China tiger, Bengal tiger and Indo-China tiger. China is also a traditional tiger consuming state. China, therefore, bears critical responsibilities for tiger conservation at the international level. To protect the tiger as an endangered species, a specific statute was issued in May 1993 to prohibit any trade in tiger bone. This is a significant contribution towards protecting this species. To facilitate enforcement of the statute and the implementation of relevant CITES resolutions and decisions, a series of effective measures have been taken by the Chinese government in recent years. There are still some challenges that must be faced by the government, and some difficult problems still exist and must be solved to promote tiger conservation and prohibit its trade. We need the understanding and assistance of the international community to better conserve the tiger as a rare and endangered species.

### **I. Legislation Measures**

#### **A. Basic framework of the laws and regulations on tiger conservation**

According to the Constitution of the People's Republic of China, the state guarantees the rational utilization of natural resources, protects rare animals and plants, prohibits any entity or individual from stealing or damaging natural resources by any methods.

Since joining CITES in 1981, the People's Republic of China has passed several laws and regulations to protect tigers, including the Forestry Law, Wild Animal Protection Law, List of Wildlife under National Protection, Regulations for Protecting Terrestrial Animals, Regulations for Protecting Marine Animals, Measures for Administering Hunting Guns and Ammunition, and Identification of Wildlife Crime Cases. The State Council issued an Order to "Strictly Protect Rare and Endangered Wildlife." The Supreme People's Court issued a "Notice on Severe Punishments for Illegal Hunting, Killing, Buying and Selling, or Trading in Wildlife." Wildlife administration departments formulated a series of rules, and local governments directly under the State Council instituted their own enforcement of wildlife conservation measures and developed local governmental rules. These combined are the basic legislative framework for tiger and other endangered species protection. The tiger is listed as a Category I species under national protection legislation. The "Wild Animal Protection Law" has specific stipulations to govern the conservation, breeding, reproduction, as well as the national and international trade in wildlife species. In addition, the Criminal Code, amended in 1996, has newly adopted provisions specifically dealing with wildlife crime: illegal trade, document forgery, smuggling activities. The provisions of relevant laws and regulations safeguard the enforcement of the ban on trade in tigers and of the production of medicines containing tiger bone, and safeguards against the sale and provides for monitoring of the tiger. These measures combined effectively promote tiger conservation and limit trade. The Chinese government is now actively drafting regulations to manage the import and export of wild fauna and flora. The criminal code has provisions for punishing those who violate wildlife protection laws. These measures will clearly improve the effectiveness of wildlife conservation, and in particular, of tiger conservation.

#### **B. Specific Statute for Protection of Trade in Tiger Bone**

On the May 29, 1993, the State Council issued the Notice on the "Prohibition of Trade in Rhinoceros Horn and Tiger Bone (NPTR&T)," which clearly put a halt to the legal production of

medicine containing tiger bone ingredients and prohibits domestic or international trade in tiger bone and other parts and their derivatives, or products containing or claiming to contain those articles. Actually, the statute has gone beyond the requirements of CITES and is the strictest measures taken by any nation. This statute covers all required measures adopted by the 9th Conference of Parties of CITES [Conf. 9.13' & Conf. 9. 13(rev)] which requires countries in tiger habitat to take measures to halt the trade in tigers. The measures taken are as follows:

- (i) All internal and international trade of tiger bone is strictly prohibited, including trade in any identifiable parts and derivatives, medicines containing tiger bone, art work and all products which are claimed to contain the ingredients of tiger bone;
- (ii) Transporting, carrying, and posting tiger bone is strictly prohibited;
- (iii) The pharmaceutical criteria for tiger bone were cancelled, and the pharmaceutical use of tiger bone is prohibited;
- (iv) Research on a pharmaceutical substitute is encouraged.

In order to carry out the notice, the State Council issued a decree "Notice on Prompt Punishment for Smuggling, Illegal Trade in Rhinoceros Horn, Tiger Bone and other Endangered Species." The Ministry of Forestry, the Ministry of Public Health, the State Traditional Chinese Medicine Administration Bureau, the State Administration Bureau for Industry and Commerce, General Customs Administration, and other relevant departments also circulated their respective notices for stricter enforcement of issues related to the prohibition in the trade of tiger bone. Among them, the Ministry of Public Health canceled the pharmaceutical criteria for tiger bone in the Pharmacopoeia of the People's Republic of China (Sinica Medica). It announced, in writing, that tiger bone and rhinoceros horn ingredients in any prescription have been deleted. This rule was transmitted to, and adopted by, all provincial levels of governments.

## **II. Law Enforcement Measures**

### **A. Inspection on trade prohibition**

To improve environmental and wildlife protection at the national level the Environmental Consultant Committee of National People's Congress and the Environmental Protection Committee of the State Council have since 1993 jointly carried out a five-year national inspection program to check enforcement of the Wild Animals Protection Law and Environmental Protection Law. After the State Council passed the NPTR&T in May 1993, the enforcement status of the NPTR&T have become a key part national inspection efforts.

In the following six years the National People's Congress, the State Council, local People's Congress and government agencies at various level have discussed law enforcement efforts in an effort to ban the trade in tiger bone and rhinoceros horn.

### **B. Sealing up and Management on the Stock of Tiger Bone and Its Products**

In 1993, all tiger bone stock within the territory of the People's Republic of China was registered and stored in safe locations and has not been transferred. The CITES Secretariat has received all relevant information. Small quantities of tiger bone have been seized in recent years during inspection activities; this has also been stored. In recent years, tiger research and breeding has been strongly promoted by government. Several breeding centers, wild animal zoos, and zoo parks that have bred tigers retain tiger parts, but this is strictly managed. For example, Hengdaohezi Cat Family Animal Breeding Center of Heilongjiang Province keeps nearly 100 tiger corpses. Tiger bone stock is shown in Table 1.

Table 1. Stock of Tiger Bone

Province	Tiger Bone (kg)	Date	Responsible Agency
Beijing	80.4	25-01-1994	Forestry Bureau of Beijing, Forestry Bureau of Beijing
Tianjin	13.319	27-11-1993	Medicine Bureau of Tianjin , Agri-Forestry Bureau of Tianjin
Shanghai	41.6	11-01-1994	Medicine Bureau of Shanghai, Agriculture Bureau of Shanghai
Guangdong	49.7	17-01-1994	Medicine Bureau of Guangdong, Forestry Department of Guangdong
Sichuan	150.80	20-11-1993	Medicine Bureau of Sichuan, Forestry Department of Sichuan
Hubei	151.61	01-02-1994	Medicine Bureau of Hubei, Forestry Department of Hubei
Heilongjiang	138.0	25-01-1994	Medicine Bureau of Heilongjiang, Forestry Department of Heilongjiang
<b>TOTAL</b>	<b>625.429</b>		

### C. Investigation and Punishment of Illegal Cases

(i) In January of 1994, about 50 kgs of authentic and artificial tiger bone and 100 kgs of other confiscated endangered species products were openly destroyed in Harbin, Heilongjiang Province.

(ii) From November of 1993 to August of 1994, there have been 2 cases of illegal selling and smuggling of tiger bone that have been recorded. A total of 8 tiger skeletons have been confiscated and 11 criminals have been arrested and then sentenced to jail.

(iii) In September of 1994, the Forestry Department of Guangxi Autonomous Region seized 577 containers of Tiger Bone and Musk Plaster produced in Sichuan Province, which were intended for transport to Fujian Province. All these products were confiscated in accordance with the notice provisions and afterwards were openly destroyed in Nanning under the supervision of representatives from CITES Management Authority of China.

(iv) On March 22, 1995, a total of 14 criminals were punished and dealt with by the Public Security Department of Liaoning Province. The smuggled products (1 tiger skin and 1 tiger skeleton) were confiscated.

(v) On August 27, 1995, 9 criminals were arrested and dealt with by the Forestry Public Security organ of Dunhua, Jilin province, under suspicion of illegally selling tiger skin and tiger bone.

(vi) In September of 1995, one case of illegal selling of smuggled tiger bone was punished by a policeman of Jilin Province; criminals in the case were punished.

(vii) In October of 1996, one case of illegal selling of tiger bone was dealt with and criminals in the case were punished by Guangdong Forestry Public Security organs.

(viii) In the second half of 1996, CITES Management Authority of China cooperated with Guangdong Provincial Government to deal with about 20 citizens of Guangdong Province, who had been reported by the Fishery and Agriculture Department of Hongkong, S. A. R., as offenders for illegally carrying tiger bone and musk plaster.

These enforcement activities strongly advance implementation of advertisement of the prohibition in trade of tiger bone, and demonstrates the position and attitude of the Chinese

Government towards conservation of tigers and other endangered species, as well as in its sincere desire to comply with CITES convention.

### **III. Public Education Measures**

The use of tiger bone in China as a medicine is thousand of years old. Tiger bone as an ingredient is well established in traditional Chinese medicine practice, and is a part of Chinese traditional culture. Banning the trade of tiger products will have a negative impact on international trade and will influence traditional medicine use, as well as affecting various areas of the economy: medical departments, pharmaceutical companies, commerce, tourism. The economic losses arising from the ban will be significant. To ensure the effectiveness of a nation wide ban, the State Wildlife Protection Department and public education programs will need to launch large-scale programs. China Central Television Station (CCTV), People's Daily, Xinhua News Agency, China Central People's Broadcasting Station and other major official mass media outlets have repeatedly reported on the contents and requirements of the NPTR&T. CCTV launched a special program of slogans about the ban in the trade of tiger bone and rhinoceros horn played that is aired in prime time to raise public awareness and to remind the public to modify its behavior. Tiger conservation is an important element in public education campaigns, and is included in Bird Appreciation Week activities, during Wildlife Appreciation Month and during wildlife law enforcement and inspection actions. Public educational activities at different levels and using various materials are a significant contribution to effect a trade ban and are raising public awareness on the need for wildlife conservation.

In addition, a series of education programs regarding the NPTR&T were conducted nationwide in recent years. A good example to illustrate the nation-wide publicity programs for tiger conservation so is the program conducted in Shanghai to provide a better understanding of the situation of wildlife conservation of China. In 1998, a public education and knowledge dissemination program organized by Shanghai required all students in primary and/or high schools of Shanghai to do something to save tiger in the year-of-tiger. The drawings of tigers by those teenagers were printed as a poster to expand the scope of public education. Using "Popular Science Day" for teenagers, public education programs and fund raising were organized and a total of 50,000 teenagers donated their own money to save the South China Tiger. Jointly with the Wildlife Conservation Society (WCS), Exxon Mobile and its "Save the Tiger Fund," Shanghai wildlife authorities printed brochures entitled "Save the Tiger" for public educational use. The mass media has publicized these activities to maximize the social benefits of these activities.

### **IV. Other Measures**

#### **A. Organization Establishment and Capacity Building**

All provinces, municipalities and autonomous regions have established their wildlife conservation authority in China and the scale of the conservation team keeps growing. The Chinese government has an officially appointed forest public security organ for professional enforcement on Law of Wild Animal Protection of The People's Republic of China, with the total team membership reaching 45000 people, who are responsible for the investigation and handling of cases, especially those on endangered species. An armed forest police force has also been officially created with a total of about 17,000 staff that is in charge of protection of forest and wildlife as well as control of forest fires.

In addition, a training center for wildlife management was built, as well as a wildlife testing center. In July of 1995, the CITES management authority of China was approved by the State and strengthened with 17 local branches and 130 staff.

In order to improve management, CITES management authority has cooperated with governmental departments of wildlife management for many years to conduct management and

enforcement training for more than 1000 people in Beijing, Harbin, Yantai, Kunming, Dalian and other places. Additionally, in association with the CITES Secretariat, three courses were held to emphasize international management practice for 300 trainees in Beijing. Through these programs, the quality of personnel has obviously improved.

### B. In-situ and Ex-situ Conservation

The total number of nature reserves in China has reached over 800, with the total area of 7,185 ha, accounting for the 7.49% of national territory. Development of this system has been under construction for 40 years, with 574 reserves that are designed to protect forest and wild animals (71.83% of total nature reserves of all types), totaling 6100 ha (85.06% area of all nature reserves) that take represents 6.37% of the area of the country. The function of nature reserves is to protect typical ecosystem of wild animals and plants, with nature reserves protecting 300 million hectares of forest ecosystems which include some of the biologically richest areas, and which are a valuable part of science and history and provide effective ecological benefits. Starting in the 1960's, some nature reserves created for the protection of tiger and other endangered species as well as their habitats were established, such as Qixinglazi of Heilongjiang Province, Changbaishan of Jilin, Baihuashan of Fujian, and Xishuangbanna of Yunnan. Nowadays few tigers still exist in these areas.

From mid-1980's, China began to strengthen its artificial breeding research, with noticeable achievements. Table 2 provides information on tiger breeding and propagation in China.

Table 2. Main centers for tiger reproduction and population size.

Region	Siberian Tiger	Bengal Tiger	South China Tiger
Shanghai Wildlife Safari Park	32		2
Jinan Wildlife Safari Park	2	12	
Shenzhen Wildlife Safari Park	33	3	
Chongqing Wildlife Safari Park	2	15	
Qinhuangdao Wildlife Safari park	30		
Panyu Wildlife Safari park	4	56	
Shanghai Zoo Park	4	2	10
Chongqing Zoo Park			4
Suzhou Zoo Park			14
Harbin Zoo Park	10		
Heilongjiang Hengdaohezi Cat Family Center	100		
Guilin Bear and Tiger Village	130		
Total	347	88	30

### C. Survey on the Resources and Relevant Research

In the early 1980's, China conducted a census of Siberian tigers, as well as in the early 1990's. A census of South China Tigers was also conducted with experts from IUCN. Starting from 1995, the survey on wild animal was conducted throughout the country, and surveys of wild Siberian tigers and South China tigers were ranked as priorities. This activity is expected to be finished by the end of this century. Since 1996, a survey of individual indicators of wild animals and plants, including Chinese tigers, was launched, including a natural resource planning program

for the valley of Wusulijing (Ussuri) River conducted jointly by China, United States and Russia. During that time, the research on the wild Siberian tiger population was also being conducted.

#### **D. Studies on Substitutes of Tiger Bone**

In order to both effectively protect endangered species and meet the needs of patients for medicine, a study to identify a substitute for rhinoceros horn and tiger bone was listed as one of National Nine-Five Top-Priority Programs in mid 1990's. The study searching for substitutes for other endangered species was included into The Acting Plan of China 21st Agenda. At present the search for a substitute for tiger bone achieved unexpected success. The Sailonggu, a substitute of the tiger bone, has put been put into practice.

#### **E. International Cooperation**

In recent years, China keeps close contact with the CITES Secretariat Standing Committee, Animal commissions, and other organizations, and has many times hosted representatives of CITES to exchange views on control of tiger bone and protection of tigers. The Workshop on Controlling Trade of Wild Animals and Plants in Asian Countries was prepared by China in October in 1995 in order to strengthen exchange and cooperation for protection of wild animals and plants. Representatives of more than 20 countries and regions attended this meeting and presented their status on implementing CITES. At this meeting the Beijing Declaration was passed, helping to implement CITES and further conserve nature.

In order to better protect tigers, China cosigned two Protocols on Protection of Tiger, one with India in March of 1995, and the other with Russia in 1997. In November of 1995, the Memorandum of Understanding on Cooperation in the Control of Illegal Trade of Wild Animals Around the Frontier Areas was signed by Ministry of Forestry and its counterpart in Vietnam. CITES management authority and customs authority of China conducted exchange visits with their counterparts in Vietnam, the Russian Federation, Korea, and Japan, discussing future cooperation in the field of control and cracking down on smuggling of wildlife, as well as other illegal activities. In the most recent four years, following cosigning of the Nature Conservation Protocol by China and United States, CITES Management Authority of both countries organized a number of exchanges, including discussion of implementation of CITES and capacity building, with participants from Management Authority, Scientific Authority, Custom Agency, and Wildlife Administration. These programs exert a very important role in strengthening import and export management as well as enhancing CITES implementation techniques.

The Chinese government communicated to the CITES Secretariat and other related organizations its action on trade prohibition and received unanimous recognition from the international community. The active and effective tiger conservation measures taken by the Chinese government were affirmed in the proceedings of COP9 and later praised by the COP10 and COP11 when tiger issues were mentioned. The concerned resolution of COP calls on all international organizations to provide support in terms of technical and financial assistance for tiger conservation and trade prohibition

### **V. The Problems and Suggestions on the Trade Prohibition of Tiger Bone**

#### **A. China's Obligation**

As a contracting party of CITES, it is the obligation for China to implement CITES in an appropriate manner. In recent years, encouraging achievements have been seen in China in the conservation of and control of trade in tiger and its products thanks to the great efforts made by the government of China, in the form of legislation, law enforcement, and public awareness measures. In the years to come, China will continue its efforts in the prohibition of trade in tiger bone, and the

conservation of tiger and other related species, especially by means of international cooperation in order to protect this particular natural resource treasure.

## **B. Other CITES Members Obligations**

Protection of endangered species requires all aspects of support in human resources, financing, and equipment. As a developing country, China is constrained in technology, funds and education. There is still a long way to go for China to catch up with developed countries in the field of wildlife conservation, and there are great challenges to be faced in conservation awareness, education, habitat protection and transition management. It is expected that the international community understands the existent practical difficulties in China in relation to wildlife protection, and therefore is willing to provide substantial support.

The Conf. 9.13 rev requires development of a forensic identification facility, and the decision of Conf. 10.43 requires countries with relevant export to assist range and consumer States to encourage and support, as a matter of urgency, the development of a forensic protocol for identifying tiger bone derivatives in manufactured medicines, and in establishment of a forensic facility to provide other technical assistance in aiding the detection and accurate identification of tiger parts and derived manufactured products. Meanwhile, it is also required that donor nations assist in funding the infrastructure and development of expertise to employ computer databases and mapping, as well as any other necessary conservation management and enforcement techniques. Convention organizations and all the states interested in trade prohibition should undertake their respective responsibilities and obligations to provide substantive assistance in techniques, funding and infrastructure, especially during this present critical period of development. Outside organizations and CITES signees are encouraged not only to engage in investigation or provide suggestions, but will be expected jointly with us to strengthen the forensics tests and to assist in the protection of tiger habitat, as well as recovery of tiger populations and law enforcement.

## **C. Stock Issue and Settlement Recommends Thereon**

### ***Problems***

(i) In the implementation of NPTR&T, tiger bones and medicines were sealed, most of which came from prior to signing of the convention and naturally animals dying of natural causes in breeding centers or zoos. This sealing resulted in the large stocking of funds estimated for RMB 2 billion and therefore represents a great loss for manufacturing and management entities. This problem has still not been resolved.

(ii) The sealed stocks do not only take up room in storehouses and containers, the costs of maintaining and protecting these stocks for such a long period are very high. The enterprises do not only make no benefits, but also have to pay for these costs. This kind of stocking evokes strong responses from relevant enterprises. Additionally, the long storage period results in boring by moths, which represents a potentially tremendous loss if the stocks are not properly treated.

Pursuant to the Convention, an exemption shall be applied to those stocks that were acquired pre-convention. Since COP9, most countries refuse to destroy confiscated specimens, believing this to be an offense of nature conservation and humanitarianism. All the countries make use of these specimens, in compliance with the principles of sustainable use, and thereby avoid the need to remove resources from the wild.

### ***Solutions***

These problems should be resolved following the Convention and our country's actual situation.

(i) For the stockpiles that resulted from actions of NPTR&T, the government, social association, the international community has the responsibility and obligation to raise funds for

compensation of relevant entities for this loss. An appropriate authority should be in charge of organizing this action so as to consolidate the achievements that have reached in trade prohibition.

(ii) For stores of tiger bone and other tiger parts, we should make use of these parts.

Suggested uses include:

- Educational application in biology and environmental studies courses at schools and universities;
- Public wildlife protection education;
- Research on tiger bone substitutes;
- Enforcement identification and investigation;
- Traditional Chinese medicine for humans, but only under strict supervision, monitoring and management.

Tiger protection requires a systematic approach that not only protects wild populations and their habitat but that investigates artificial breeding and propagation to enlarge the population. Enforcement efforts must be intensified crack down on illegal poaching, sale, smuggling, and other illegal production and management activities. Various policies are needed to address different issues. Old tigers and animals obtained from artificial breeding centers should be used for education and research purpose in the interest of protecting human health and livelihood.

The CITES Management Authority is a unique government representative in China and works to carry out import and export provisions. The agency strictly enforces provisions, national laws and regulations on the ban in trade of tiger parts. We carry out our work with local authorities and local governments, and we are always looking for ways to improve the ban on trade.

## SESSION 10. CONSERVATION OF THE FAR EASTERN LEOPARD

### Introduction to Session 10.

The Far Eastern, or Amur leopard (*Panthera pardus orientalis*) is one of the most endangered subspecies of large cats in the world. Reduced to a fraction of its original population, there are known, fragmented populations in Jilin and Heilongjiang Provinces of northeast China and southwest Primorye Krai of the Russian Far East. There are likely wild Amur leopards in North Korea, but their status is unknown. Recognized as a genetically discrete population (Miththapala et al. 1996), this subspecies deserves protection as a northernmost, unique genetic contribution to biodiversity of the species and the region, and as a top carnivore indicator of ecosystem health and integrity.

While anonymity can be a form of protection, for the Far Eastern leopard, it has been a curse. Forced to live in the shadows of the more glamorous, charismatic Amur tiger, with whom it has overlapping ranges, the leopard has been ignored by conservationists, wildlife management specialists, and the local citizenry. While millions of dollars from the international conservation community has been invested in protection and study of the Amur tiger since the opening of Russia in 1992, until recently the leopard has been virtually ignored.

Despite its anonymity, the woes of the Far Eastern leopard are many. It is severely threatened with extinction, much more so than the Amur tiger. While a 1996 survey of the Amur tiger suggested that 330 to 370 adults survived in Russia, a series of surveys on leopards has consistently pegged the number of remaining individuals to be between 20 and 30, making it one of the most endangered of the large cats. While the range of the tiger extends 600 miles north into Russian territory, the historic range of leopards, who are less tolerant of snow and cold, includes only the southwest section of Primorskii Krai. With much of its former habitat eliminated in China, the Far Eastern leopard's range has shrunk to one small fragment of habitat along the Chinese-Russian boundary. Habitat destruction, intensive logging, elimination of prey base, and direct hunting (both legal, and more recently, illegal) have all played a role in reducing this subspecies to a fragment of its former habitat.

Now, with such a small, isolated population, the threat of inbreeding and loss of genetic variation has lead many Russian biologists to fear that the days of the Far Eastern leopard are numbered. And unfortunately, the zoos of the world, usually the last hope for endangered species, hold a meager number of pure, Far Eastern leopards. Although hundreds of Far Eastern leopards are listed in studbooks (breeding records) maintained in both North America and Europe, all but eight of these animals have, in their lineage, interbred with other subspecies.

Although the intent of this meeting was to focus on tiger conservation in northeast China, it also provided a unique opportunity for Russian and Chinese specialists to consider necessary steps to protect the Far Eastern leopard in the same region.

# FAR EASTERN LEOPARD AND SIBERIAN TIGER CONSERVATION MEASURES

Han Xiaodong  
Jilin Provincial Academy of Forestry Sciences  
Tiger and leopard investigation Team of Jilin Province

Like the Siberian Tiger, the Far Eastern Leopard is one of the largest Felidae and lives mainly in the eastern mountains of Jilin Province. Survey data show that the number of leopards is very low and that it is even more endangered than the tiger. There is an urgent need to step up our efforts to study and monitor its population and to develop a conservation strategy.

## 1. Distribution of the Far Eastern Leopard in Jilin Province

Historically, the leopard was distributed between the northeast and southwest slopes of the Changbai Mountains and was found in Hunchun and Belong Counties that border Russia on the east, to Yanbian Prefecture bordering Jilin City to the west, Laoyeling in the south, and Wangqing County neighboring Heilongjiang to the north. This is an area of 600,000 km<sup>2</sup>. With the increase in human activities and the impact of these activities on surrounding habitat, the volume of leopard habitat gradually decreased. Typically, the leopard would be found in Yanbian and Hunjiang Districts/Counties, and in the 1970s, it was even seen in the Lading Mountains in south and middle-eastern mountains of Jilin. In the 1980s it disappeared in Tonghua and Jilin districts and as of the early 1990s, the leopard was only on rare occasions observed on the southwest slope of Changbai Mountains. A recent survey shows that leopards are found only in Dalongling and Haerbaling regions of China, Russia and North Korea, the northeast slope of Changbai Mountains.

## 2. Population Size

The number of leopards in Jilin Province decreased from about 50 in the 1970s to less than 10 at the end of the 1990's. Table 1 shows that the number of leopard in Jilin has annually decreased, with a total decrease of 84.4% in the last 30 years. The leopard is on the verge of extinction and its habitat is limited to a very narrow region.

These animals were found primarily in the China-Russia boundary region.

Table 1. Far Eastern Leopards in Jilin Province

Survey time	Northeast slope	Southwest slope	Total
1976-77	31	14	45
1982-83	23	7	30
1991-91	15	3	18
1998.2-	4+3	0	7

## 3. Reasons for the Decrease in the Leopard Population

There are many reasons why leopard have decreased in number, but the main reasons are:

**3.1.** Most leopard habitat, and that of its prey, has been lost to logging. Increased competition from humans for territory and food is also a cause. Another problem is fragmentation and isolation of habitat, which makes it difficult for leopards to find mates, and which results in reproductive isolation and genetic loss, thereby decreasing in the leopard's reproductive capacity.

**3.2.** Human activities disrupt the leopard's way of life. Not only has development of the forestry industry resulted in large amounts of habitat loss, logging also directly disturbs the behavioral patterns of leopards and that its prey. Logging has brought increased human population and introduced new forms of economic development, for instance, mining, that seriously imperil the leopard's existence.

**3.3.** Poaching is another threat. With passage of wildlife protection laws and other related regulations in China, wildlife administration agencies, and some conservation groups are now addressing this issue and taking effective steps to improve education, to confiscate hunting rifles, and to establish hunting bans. However, some people continue to hunt and poach leopards and their prey using snares and traps. This both reduces the amount of prey available to the leopard and directly threatens the animal.

#### **4. Relation between Leopard and Tiger Conservation**

Since both the leopard and the tiger are large felids, their prey and habitat requirements share many similarities, though there are also differences.

According to tiger and leopard surveys along the Chinese-Russian boundary in February 1998, leopard and tiger distribution overlapped in some areas. This occurred in three of our five research areas.

There is a very close relationship between leopard and tiger conservation, especially in the three areas where overlap occurs. In these areas we must provide special emphasis on each of the species' specific conservation needs while at the same developing a comprehensive conservation plan.

#### **5. Needed Conservation Measures for Leopards**

**5.1.** Set up a monitoring system and develop a long-term project to monitor leopard populations, its habitat and prey. Using this data, develop GIS based maps for leopards and their habitat to assist in implementing proactive management of the species.

**5.2.** Examine current prey patterns for leopards and tigers and apply bio-technical means to stabilize and improve prey habitat to protect both species.

**5.3.** Select suitable regions in Dalongling and Haerbaling to establishment an international reserve. Set up separate, single species reserves for the leopard. Carry out baseline studies, improve genetic diversity of the wild population by hand raising and releasing leopards into the wild to increase their reproductive capacity and to restore and expand wild populations.

**5.4.** Establish ecological corridors between main habitat areas for more effective exchange of mates and to improve genetic diversity among leopards in different areas, and to accelerate the recovery of the wild population.

**5.5.** Improve legal instruments while simultaneously expanding conservation education efforts for the leopard and its preys. The objective is to change the way people view the leopard and its preys through planned, organized educational efforts that lead local people to pledge their support for conservation efforts.

# A SURVEY OF DISTRIBUTION AND NUMBER OF LEOPARDS IN EASTERN HEILONGJIANG PROVINCE CHINA

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## 1. Study Area and Methods

The survey was focused in the eastern mountainous area of Heilongjiang Province, China, near the borders of Russia and Jilin Province, including Laoyeling, Zhangguangcailing and Wandashan forested regions. The geographic borders are 128.24° and 134.05° E longitude, and 43.08° and 47.05° N latitude. The region is bound to the south by the provincial border with Jilin, and to the east by the international border with Russia.

The survey area is part of the middle and lower regions of Changbaishan mountain region. The topography is complex and diverse in the survey area, with an average elevation between 500 and 1000 m. This region is characterized by a temperate, oceanic climate that is the warmest and wettest of Heilongjiang province. The annual mean temperature is 2.3° C, with the mean temperature in January -18.6° C, and mean temperature in July 21.6° C. Yearly average rainfall is 500-700 mm. The frost-free season lasts 122-151 days. In winter, the mean snow depth is 30-50cm, but snow depth may reach 60- 70cm or more in higher mountainous areas. Vegetation within the survey area belongs to the Changbaishan Mountain floristic zone. Vegetation types include mixed conifer, mixed conifer-broad-leaved forests, secondary broad-leaved forest/shrub land, and marsh meadows.

The survey method included field survey routes and interviews. The field survey covered 67 routes, distributed across six forests bureaus. The survey routes were 606.4 km in total length, the average being 9 km. Two hundred and thirty questionnaires on tigers, leopards and other species were distributed within the survey areas. There were 66 responses. Between 1995-1999, more than 160 people in the survey area were interviewed. The interviews provided information on 32 leopard contacts. Because no sign of leopard activity was found, the interview data is an important part of the leopard survey.

## 2. Number of leopards

Leopards appear to be sparsely distributed and quite rare in Heilongjiang Province. Existing information makes it difficult to estimate the number of leopards left. Field surveys failed to reveal any evidence of leopards. Some of the interview data suggests that leopards may still occur in Laoyeling and Zhangguangcailing.

Based on interview data (Table 1), we estimate that during the 1998-1999 winter, three to five leopards may have been present within the survey area in eastern Heilongjiang. The information summarized here is also given in Table 1.

**Leopard #1.** Based on interviews 11, 12 and 13 (Table 1), we estimate that one leopard was possibly present in the southern part of Suiyang forest Bureau of southern Laoyeling. There is suitable leopard habitat in Sanjielazi, Liumaogou, Hanconghe, Sanchahe and Nuanquanhe districts of southern Suiyang Forest Bureau, which is contiguous to leopard habitat in Southwest Primorye, Russia.

**Leopard #2.** Based on interviews 2,3 and 4 (Table 1), at least one leopard could possible have been present in Muling Forest District of Southern Laoyeling in the 1998-1999 winter.

**Leopard #3.** According to interviews 1, 5 and 8 (Table 1), it is likely that that at least one leopard was present in Shuangqiao and Laoheishan districts of Northern Laoyeling (northern Suiyang Forest Bureau) in the 1998-1999 winter.

**Leopard #4.** Based on interview 9 (Table 1), it is possible that one leopard was present in Dahailin Forest Bureau of southern Zhangguangcailing.

**Leopard #5.** One leopard may have been present in Lingkou Forest Bureau of Northern Zhangguangcailing in 1998-1999 winter, based on interviews 6, 7 and 10 (Table 1).

Table 1. Evidence used for estimating number of leopards, based interviews of local people in eastern Heilongjiang Province, China, winter 1999.

No.	Location Region	Forest district	Interview #	Quality of information	Estimated # leopards
1	Southern Laoyeling	Sanchahe, Hanconghe, Suiyang	11, 12, 13	unconfirmed	0--1
2	Southern Laoyeling	Muling	2, 3, 4	good	1
3	Northern Laoyeling	Shuangqiao, Laoheishan	1, 5, 8	good	1
4	Southern Zhangguangcailing	Changting, Dahailin	9	unconfirmed	0--1
5	Northern Zhangguangcailing	Shidao, Fendou, Chaoyang, Lingkou	6, 7, 10	good	1
Total					3--5

### 3. Distribution and status of leopards within study regions

Based on field surveys and interviews, we have undertaken a review of the status of the study regions as potential leopard habitat. We do not include Eastern Wandashan for which the 1999 winter survey provided no information about leopards.

**(1). Southern Laoyeling.** Eleven interviews suggest that this region may be the most important for leopards. Southern Suiyang has the most suitable habitat for leopards and is immediately adjacent to Borisovkoe Plateau Zakaznik (wildlife refuge) in southwest Primorskii Krai, Russia, considered prime leopard habitat and is the key area in Russia for protecting leopards. Southern Suiyang Forest Bureau, in combination with potentially good habitat in Hunchun County in Jilin province (which also borders leopard habitat in Russia), should be considered vital habitat for the Far Eastern leopard. It will be critical to protect prey resources and habitat in this region and to insure that connectivity exists between suitable habitat in Southern Laoyeling, Heilongjiang, Hunchun Jilin, and southwest Primorye Krai.

**(2). Northern Laoyeling.** Seven interviews, including what appears to be a visual observation, suggested that leopards still occur in Northern Laoyeling close to the Russian border. In the past five years, a number of tracks have been reported. A simultaneous survey in Pogranichny Raion, Primorye (opposite Northern Laoyeling) failed to provide evidence of leopards this winter, although leopards have been reported here in the 1990's. There is relatively little suitable habitat (even including Pogranichny Raion in Russia). Survival of leopards (and tigers) will depend on providing corridors to other habitat patches in the region.

**(3). Southern Zhangguangcailing.** Three interviews suggest that leopards may be present in this region. There are some secluded areas in Southern Zhangguangcailing that could harbor leopards, but anthropogenic disturbances, including intensive logging, heavy snaring, and lower prey densities make this region relatively poor habitat for leopards.

**(4). Northern Zhangguangcailing.** Although no survey routes were covered here, three leopard sightings were reported in the region in 1996-1998.

Table 2. Evidence of leopards gathered from interviews of local citizens in eastern Heilongjiang Province, China.

Name	Occupation	Date of observation	Region	Location of Observation			Type of Information
				Forest Bureau	Forest District	Location	
1 Li Cunshan	Forestry official	Apr-98	Northern Laoyeling	Suiyang	Shuangqiao	Subdivision 55	Heard that a local forest worker saw a leopard at the watchtower.
2 Peng Xuewen	Forestry official	1997	Southern Laoyeling	Muling	Laodagou	Subdivision 41	Heard local forester worker saw leopard track.
3 Peng Xuewen	Forestry official	Jan-97	Southern Laoyeling	Muling	Gonghe	Subdivision 51	Heard a leopard track was seen.
4 Peng Xuewen	Forestry official	12-Nov-98	Southern Laoyeling	Muling	Gonghe	Subdivision 49-51	Heard a leopard track was found.
5 Xu Zhengmin	Guide	Winter 1996	Northern Laoyeling	Suiyang	Shuangqiao	Subdivision 62, 63, 73, 75	Saw leopard tracks twice.
6 Fu Weiwo	Forestry official	Nov-97	Northern Zhangguangcailing	Lingkou	Shidao	Subdivision 57	Heard that a dog was killed by a leopard.
7 Fu Weiwo	Forestry official	Winter 1996	Northern Zhangguangcailing	Lingkou	Fenduo		Heard a leopard track was found.
8 Yuan Fengqin	Forestry official	Dec.-98	Northern Laoyeling	Bamiantong	Laoheishan	Subdivision 16	Heard that a local worker saw a leopard track.
9 Wang Jingwen	Forestry official	Spr.-98	Southern Zhangguangcailing	Dahailin	Changting	Subdivision 138	Heard that a local worker saw a leopard track.
10 Duan Xiangkun	Guide	Winter-98	Northern Zhangguangcailing	Lingkou	Chaoyang	near the village	Saw a leopard track, and livestock was injured by leopard.
11 Li Cunshan	Forestry official	Winter 1993	Southern Laoyeling	Suiyang	Sanchahe		Saw a leopard.
12 Zhang Chuanfa	Worker	Jan.-1994	Southern Laoyeling	Suiyang	Sanchahe	Subdivision 34	Saw a leopard track; after a few days, One person was injured by leopard.
13 Liu Xingjiang	Forestry official	Jul-95	Southern Laoyeling	Suiyang	Hanconghe		Saw one leopard with two youngs.

Cont. of Table 2

14	Li Ming	Worker	1985	Southern Laoyeling	Dongjingcheng	Dongfanghong	Subdivision 75	Saw a leopard.
15	Xie Jianlin	Worker	1989	Southern Zhangguangcailing	Dongjingcheng	Fuyu	Subdivision 103-104	Saw a leopard track.
16	Li shiyou	Worker	1989	Southern Laoyeling	Dongjingcheng	Honhqi	Subdivision 35- 36	Saw a leopard.
17	Zhang Shuhui	Worker	1988	Southern Laoyeling	Dongjingcheng	Huashu	Subdivision 38	Saw one leopard with two young.
18	Yu Tonghai	Forestry official	1990	Southern Laoyeling	Dongjingcheng	Huashu		Heard one person was injured by leopard.
19	Xu Zhenmin	Forestry worker	Dec. 1994	Northern Laoyeling	Suiyang	Shuangqiao	Subdivision 1-6	Saw a leopard
20	Zhang Qingyi	Forestry worker	Nov. 1994	Northern Laoyeling	Suiyang	Hanconghe		Saw a leopard track
21	Zhang Qingyi	Forestry worker	Aug. 1993	Northern Laoyeling	Suiyang	Huangshong Daheigou		Saw a leopard
22	Zhang Xuefeng	Forestry worker	Sep. 1995	Southern Laoyeling	Muling	Yangmuqiao		Saw a leopard
23	Zhang Chuanfa	Forestry worker	Feb. 1994	Northern Laoyeling	Suiyang	Sanchahe		Person injured by leopard
24	Xu Qingsheng	Forestry official	1992	Southern Zhangguangcailing	Dahailin	Qianjin		Heard that a worker saw a track
25	Liu Enhua	Forestry worker	1992	Wandashan	Dongjingcheng	Fendou		Heard that a worker saw a track

# CONSERVATION OF THE FAR EASTERN LEOPARD

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Vladivostok, Primorskii Krai

Respected Colleagues, Comrades, and Gentlemen!

Allow me to thank the organizers of this seminar for the opportunity provided to meet with you and to discuss issues of protecting the Far Eastern leopard.

The Far Eastern leopard is the species whose fate troubles us most. The Far Eastern leopard, more than any other species, demands protection. Protection measures must be taken immediately. The problem is made more difficult by the fact that the Amur tiger, whose population numbers are not an immediate cause for concern among Russian specialists, is given a great deal more attention.

Like the Amur tiger, the Far Eastern leopard is federal property. On August 7, 1998, the Federal Committee on Ecology approved a "Strategy for the Conservation of the Far Eastern Leopard in Russia." However, the federal government has not approved a program for the protection of the Far Eastern leopard.

Practically all of the Far Eastern leopard's habitat in Primorskii Krai, and this includes portions of Nadezhdinsky, Ussuriisky, Khasansky and Oktyabrsky Raions, is protected territory. That region includes Kedrovaya Pad Zapovednik, the Federal Reserve Barsovy, and the regional Reserves Borisovskoe Plateau and Poltavsky. The number of Far Eastern leopards in the wild is somewhere between 30-40, and some specialists believe the number is even less. Leopard numbers are not increasing, and the current trend is toward a decrease, although, and I repeat, its habitat is located in protected territories and the leopard's prey base is adequate. In fact, the number of sika deer in certain areas is so great that they cause noticeable damage to the forest industry. There is also a likelihood of some negative, internal population issues, such as inbreeding, etc. Such a low population number means the species is already on the close to losing its viability. Natural expansion of the leopard population is difficult since its existing habitat is surrounded by intensive agricultural activity to the north and south, by the Sea of Japan to the east, and to the west, by a string of engineering structures used by border guards. One possible measure for protecting the Far Eastern leopard could be establishment, from the side of the People's Republic of China, a protected territory. I do not, however, have information on if there is adequate prey for the leopard or why the leopard has not settled the Chinese side in earlier times. And even so, this measure is of secondary importance since the carrying capacity on the Russian side of the border, in Primorskii Krai, is adequate to support a large population of leopards and a shortage of territory is not the factor limiting its numbers.

Based upon scientific recommendations, it possible that conservation of the Far Eastern leopard might shift from comprehensive conservation measures to a specific program to rebuild numbers by raising leopards in captivity for release in the wild. This should be undertaken only if there is a firm belief that raising captive leopards would result, upon release, in their successful survival in the wild.

**(Session 11 is not presented here, as it represents a first draft of the Action Plan for the Amur tiger, which is reported separately)**

## **SESSION 12. OPPORTUNITIES FOR SUPPORT FROM THE INTERNATIONAL CONSERVATION COMMUNITY**

### **Introduction to Session 12.**

Successful implementation of a recovery or action plan often requires international participation, and there often exist opportunities for support – both financial and technical – from a variety of international organizations interested in tiger conservation.

One of the purposes of this workshop is to invite representatives of some of the organizations interested in supporting future efforts to develop and implement a tiger recovery plan to obtain background information on a Amur Tiger recovery plans in north China. A brief introduction to several of these organizations, and how they may become involved, follows.

## **RHINOCEROS AND TIGER CONSERVATION FUND OF THE U.S. FISH AND WILDLIFE SERVICE**

Fred Bagley  
U.S. Fish and Wildlife Service

The Rhinoceros and Tiger Conservation Fund, administered by the U.S. Fish and Wildlife Service, provides grants for conservation of wild populations of tigers and rhinos. These grants have supported projects dealing with surveys, environmental education, law enforcement, habitat management, and efforts to decrease human/tiger conflict.

The Fund seeks to strengthen local conservation efforts by placing an emphasis on developing partnerships with local government and non-government organizations. Sixty percent of the grant funds have gone direct to government and non-government organizations within the countries where tigers and rhinos occur. This is appropriate as the ultimate survival of the tiger and rhinoceros depends upon the people of the countries where the wild populations occur. The other 40% of the program's funds have been provided to international conservation organizations for projects, which also strengthen local capacity.

The Fund has operated for 5 years. During this time 105 grants totaling over US\$2,100,000 have been provided for field level projects designed to rapidly produce conservation benefits. Fifty-two percent of these funds benefited tigers.

The program is modest both in the total funding available and the size of the grants provided.

For the year 2001, the program's funding level is \$750,000. The typical grant is for a one-year project and is for \$ 30,000 or less. Grants of this size have been found to be very effective in strengthening local conservation projects. And they give encouragement to local governments to continue (or perhaps even increase) support for conservation.

Over the past 5 years the Fund provided 27 grants to African countries. In Asia, the Fund provided 19 grants to India, 17 to Russia, 13 to Indonesia, 12 to Vietnam, 5 to Nepal, 4 to China, 3 to Cambodia, 3 to Malaysia, and 2 to Thailand. The grants to China included one to the Division of Fauna and Flora, Department of Conservation, State Forest Administration located in Beijing for a survey and habitat assessment for the South China Tiger, one to the National Detecting Center of Wild Fauna and Flora of China located in Harbin for public education on Siberian tiger conservation, one to TRAFFIC East Asia for preparation of a Chinese language version of the proceedings of the First International Symposium on Endangered Species Used in Traditional East Asian Medicine, and one to the Wildlife Conservation Society for partial support of this workshop.

Copies of the Funds guidelines for proposal preparation as well as a list of funded projects is available in Mandarin and English. The guidelines are also available in Russian. For copies or additional information contact Fred Bagley, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, Suite 730, Arlington, VA 22203 (Phone: 703-358-1760, Fax: 703-358-2849, E-mail: fred\_bagley@fws.gov).

Proposals addressing Siberian tiger conservation in northeast China are invited. Those which include efforts to promote information sharing and collaboration among conservationists of the countries of the Siberian tiger's range will be of particular interest.

## ZOOLOGICAL SOCIETY OF LONDON AND 21<sup>ST</sup> CENTURY TIGER

Sarah Christie  
 Conservation Programs Coordinator  
 London Zoo  
 Zoological Society of London  
 EEP Coordinator for Tigers  
 EEP Coordinator for Amur leopards  
 EEP Coordinator for Asiatic lions

Good afternoon. I am here as a representative of two organizations; the Zoological Society of London (ZSL), of which London Zoo is a part, and 21st Century Tiger, a wild tiger conservation partnership between Global Tiger Patrol and London Zoo, of which Esso UK is a founder supporter.

I work for ZSL and it is a large part of my job to coordinate management of the populations of Amur tigers and Amur leopards in zoos throughout Europe, Russia and the CIS. Tanya Arzhanova of Moscow Zoo is my co-Coordinator in the Amur leopard program. We have about 230 tigers and 105 leopards in these programs. The reason for maintaining populations of these big cats in zoos is to generate support from them for the conservation of their wild relatives. This support comes in four main categories:

- 1) A basis for education programs; many millions of people visit zoos every year and there is no better time to inform people about conservation of these big cats than when they are actually looking at a living animal.
- 2) Generation of useful data and skills; zoos have contributed much basic information on tiger and leopard biology as well as the veterinary skills that are needed to put radiocollars on these animals for field studies.
- 3) The "genetic lifeboat"; a potential source of animals for reintroduction, if a reintroduction is judged to be a useful part of an integrated conservation program also aimed at conserving the wild leopard population.
- 4) And of course, a base for fundraising for field projects; both these breeding programs have generated significant funds for wild tigers and leopards.

At London Zoo, we have established 21st Century Tiger, a separate foundation whose role is to raise money for selected wild tiger conservation projects. Our funds come from the zoos in the breeding program, from the UK government, and from businesses. So far, we have provided close to half a million US dollars for projects in Sumatra, India and Russia. For example, last year 21CT purchased the new and powerful radio system that enables all the tiger antipoaching teams in the region to communicate with each other over the vast distances in the Russian Far East. We have a special format for proposals, which we can email to anyone interested (contact Sam Knowles on <sam.knowles@zsl.org>).

For Amur leopards, we do not have a special foundation, but zoos in the program have so far provided close to US \$100,000 for leopard conservation measures through the Tigris Foundation. We are continuing with this, and are also seeking private and commercial sponsorship for leopard work.

Finally, many of you are already familiar with the book "Riding the Tiger" which came out of the ZSL symposium "Tigers 2000" in 1997 and is edited by Seidensticker, Christie and Jackson. We were given a grant by the Save the Tiger Fund to distribute 1000 copies of this book to active and potential tiger conservationists worldwide; despite a great deal of hard work there are still a few copies left; please email me if you would like one. A Russian translation, text only, is available from the Phoenix office in Vladivostok while stocks last.

Thank you.

## **Appendices**

## Appendix 1.

### RESOLUTION OF THE INTERNATIONAL WORKSHOP TO DEVELOP A RECOVERY PLAN FOR THE WILD AMUR TIGER POPULATION IN NORTHEAST CHINA

#### Introduction

The Amur tiger is greatly endangered in northeast China. With an estimated 7-9 individuals in Jilin, and 5-7 in Heilongjiang, the Amur tiger is on the brink of extinction in China. Despite the immediacy of the threat, conservation efforts in the region have been insufficient to adequately protect the tiger in North China.

A workshop was convened in Harbin Heilongjiang Province, October 20-23, 2000, to develop recommendations for developing a recovery plan for the wild Amur tiger population in Northeast China. The workshop was organized by the Heilongjiang Forestry Department and Wildlife Conservation Society, and included 65 participants from 6 countries. This workshop represents the first practical step towards development of a conservation strategy for the Amur tiger in China, acts as an advertisement of its plight, and provides a mechanism for adopting a recovery plan as a part of the National Strategy supported by the Chinese State government.

The following points were agreed upon by workshop participants:

#### Concerning Development of a Recovery Plan:

1. Workshop participants approve the preliminary draft "Proposals for Recovery of the Wild Amur Tiger Population in Northeast China" resulting from this workshop as a basis for further recovery activities.

2. In order to complete preparation of proposals, and develop a working document, workshop participants approve creation of an Amur Tiger Working Group that is composed of the following individuals:

Amur Tiger Working Group: Zhang Endi, Yu Xiaochen, Jiang Jinsong, Cui Guanfang, Zhang Chuanjun, Zhou Xuanbing

Additionally, workshop participants request oversight of the preparation of the proposal by the State Forestry Administration.

3. The primary task of the Amur Tiger Working Group is to use the preliminary draft to prepare the working document, "Proposals for Recovery of the Wild Amur Tiger Population in Northeast China." The working group should seek advice and information from other specialists, both within China, and from the international community (especially from Russia, since both tigers and leopards frequently cross the international border) to develop a comprehensive plan.

4. Workshop participants are encouraged to provide written commentary on the working document within a to-be specified timeframe after completion.

5. The Amur Tiger Working Group will take responsibility for finalizing the working document and presenting this document for consideration and review by the China Forestry Administration to be included as part of a National Action Plan for the Amur tiger.

6. The Amur Tiger Working Group will publish and distribute the results of the working document "Proposals for Recovery of the Wild Amur Tiger Population in Northeast China."

#### The following recommendations concerning conservation of tigers are also made:

1. Workshop participants recommend that the Chinese government review and approve the working document "Proposals for recovery of the Wild Amur Tiger Population in Northeast China," and give it priority consideration.

2. Workshop participants recommend that creation of protected areas along the Russian border in Hunchun County, Jilin, Suiyang Forest District and Wandashan Mountains, Heilongjiang, are of highest priority, and should be implemented in the nearest future.

3a. In consideration of the importance of linkages between the Russian and Chinese tiger populations, workshop participants request that the Russian and Chinese governments agree to work cooperatively to increase effectiveness of tiger and leopard conservation, especially in protecting key habitat.

3b. Workshop participants request that the appropriate agencies in Primorskii and Khabarovskii Krai assess the potential to create territories with restricted use regimes for natural resources for those areas that provide for movement of tigers across the international border, with highest priority given to Strel'nikov Range, the border region of Pogranichny Raion, and southwest Primorye.

4. Workshop participants request that the Governments of Russia and China work cooperatively to better protect populations of those rare and endangered that occur in both countries, especially populations of tigers and leopards.

5. Workshop participants request international financial and technical support for implementation of conservation actions to save the wild tiger population in Northeast China.

Finally, the workshop participants thank:

The Heilongjiang Forestry Department for organization and support of the workshop and The U.S. Fish and Wildlife Service's Tiger-Rhinoceros Conservation Fund for its support.

This resolution was passed by consensus of the workshop participants on October 23, 2000, in Harbin, Heilongjiang Province, China.

**Appendix 2.****PROTOCOL BETWEEN THE GOVERNMENT OF THE RUSSIAN  
FEDERATION AND THE GOVERNMENT OF THE PEOPLE'S REPUBLIC  
OF CHINA ON TIGER PROTECTION**

The government of the Russian Federation and the government of the People's Republic of China, hereafter called Parties,

To strengthen and further develop friendship and relations between the peoples of the two governments, to enhance collaboration in the area of tiger protection, to implement joint efforts in preventing the disappearance of this species, to assure the survival and to increase its numbers,

Agree to the following:

**ARTICLE 1.**

The Parties will undertake joint measures to stop poaching, contraband and trade in tigers, in parts of the tiger as well as its derivatives.

**ARTICLE 2.**

The Parties will implement national and international information and education measures to stop poaching, contraband and trade in tigers, in parts of the tiger as well as its derivatives.

**ARTICLE 3.**

To implement a scientifically based system of measures for tiger protection and its habitat, the Parties will develop a program to exchange specialists in the areas of management, science and technology, as well as develop plans for scientific research, education and training.

**ARTICLE 4.**

The Parties will undertake an information exchange on the measures necessary to stop all forms of illegal activity relative to the tiger, to any portions of the tiger's body, and also of derivatives from it.

**ARTICLE 5.**

The Parties will periodically generalize and analyze the results obtained through measures jointly implemented for tiger protection.

**ARTICLE 6.**

This Protocol takes effect on the date signed, remains in force for five years and is automatically extended for subsequent five year periods until one of the Parties six months prior to the expiry of the respective period informs in written form the other Party of an intention to terminate the activity.

Completed in Beijing on November 10, 1997 in two copies, each in Russian and Chinese, and each text having equal force.

For the Government  
of the Russian Federation

For the Government  
of the Peoples' Republic of China

## Appendix 3.

### LIST OF PARTICIPANTS

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