



China - Thailand Cooperation Workshop:

Survey and Monitoring Techniques for Conservation of Tigers in the Wild

Huai Kha Khaeng Wildlife Sanctuary
27 March – 2 April 2006



ACKNOWLEDGEMENTS

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Saksit Simchareon and Achara Petdee of Khao Nang Rum Research Station organized the substantial on-site logistics at Huai Kha Khaeng Wildlife Sanctuary. Budsabong Kanchanasaka of the Wildlife Research Division organized the Thai participants. Jonathan Murray organized transportation and other logistics in Bangkok and assisted with overall management of the workshop.

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EXECUTIVE SUMMARY

A workshop entitled “China - Thailand Cooperation Workshop: Survey and Monitoring Techniques for Conservation of Tigers in the Wild” was held at Huai Kha Khaeng Wildlife Sanctuary (HKKWS) from 27 March through 4 April 2006. The purpose of the workshop was to accelerate the progress of several tiger conservation initiatives in China and Thailand by providing training and practical experience for Chinese and Thai field biologists, rangers, protected areas managers, and other government officers in the techniques required to assess and monitor the status of tiger and other large carnivores and their prey base, and to foster closer bilateral cooperation in tiger conservation.

The workshop was conducted at Khao Nang Rum Research Station in where a long-term tiger research project was initiated in 2004. Workshop objectives included developing field and analytical skills in a range of topics, drafting custom project handbooks to support tiger conservation efforts at a number of sites in Thailand and China, and developing proposals to assess the status of tigers in South and Southwest China and at a number of protected areas in Thailand that occur within the Tennasserim Ecoregion.

A total of 16 Chinese and 8 Thais participated in the workshop and an additional 8 field staff from Huai Kha Khaeng helped to lead field exercises. There were 6 instructors from the Department of National Parks, Wildlife and Plant Conservation (DNP), Wildlife Conservation Society (WCS) and University of Minnesota (UMN) and 2 guest lecturers from HKKWS. The 7 day workshop covered the following topics:

- The Global Positioning System and Collection and Management of Spatial Data
- Mammal and Mammal Sign Recognition and Documentation
- Selecting Survey Methods
- Recce - Patrol Surveys
- Pellet/Dung Count Methods
- Distance Sampling Methods
- Camera Trapping
- Carnivore Scat Analysis
- Tiger Capture and Immobilization
- Telemetry, GPS, and Satellite Collars: Ecological Research and Monitoring Approaches
- Tiger Habitat Evaluation and Monitoring
- Protected Area Management for the Conservation of Tigers
- Ecosystem Management
- Production of customized handbooks to guide tiger conservation efforts at various sites

All workshop participants and facilitators considered the workshop a success and in addition to achieving its specific stated objectives, the workshop allowed participants to develop useful professional relationships and explore new opportunities for collaboration and cooperation.

The skills and ideas acquired at the workshop will contribute directly to the development of tiger conservation efforts at sites in both China and Thailand.

执行概要

本研讨班名为“中泰合作研讨班：野生虎保护的调查与监测技术”，于2006年3月26日至4月4日在泰国怀考肯野生动物保护区（HKKWS）举行，目的在于通过对中国和泰国的野外生物学工作者、保护区管理人员和从事野生动物管理的相关政府工作人员提供技术培训和实地经验，使之能够评估虎和其他大型食肉动物及其猎物资源的现状，并且促进加强在虎保护领域的交流与合作，推动两国内若干虎保护项目的进程。

研讨班的地点位于保护区内的考纳让野外研究站。该研究站自2004年起开始对野生虎进行一项长期的研究项目，研究力量齐备。本研讨班的具体目的为培训野外调查及分析的一系列技能，撰写适用于中国和泰国各个野生虎保护项目的实用技术手册，以及初步起草后续项目申请书，例如对中国西南、华南及泰国 Tennasserim 山系生态区内的各个保护区的老虎现状进行调查和监测等。

共有16名中国学员和8名泰国学员参加了此次培训，由来自怀考肯保护区的12名野外工作人员带领进行野外实地练习，由来自泰国国家公园、野生动物和植物保护管理局（DNP）、野生动物保护协会（WCS）和明尼苏达大学（UMN）的6名教师和2名怀考肯保护区的客座讲师授课。此次研讨班为期7天，主要课程如下：

- 全球定位系统 GPS 的应用和空间数据的收集和处理
- 哺乳动物和哺乳动物痕迹的识别和记录
- 调查方法的选择
- 巡逻调查法
- 粪便/粪堆调查方法
- 距离样线调查法
- 红外感应相机使用技术
- 肉食动物粪便分析技术
- 虎的捕捉和麻醉技术
- 无线电, GPS 和卫星颈圈：生态行为研究和监测方法
- 虎栖息地的评估与监测
- 侧重于老虎的保护区管理
- 生态系统综合管理
- 撰写因地制宜的野外技术手册以指导各地的老虎保护项目

该研讨班举办得相当成功，全体参与者和协调者均给予了很高的评价。研讨班不仅圆满地实现了各项特定的预期目标，并且促进参与者之间建立紧密的工作联系，为将来进一步的合作奠定了良好的基础。

各参与者通过本次研讨班学习的技能和思路将对于中泰两国各地虎的保护工作产生直接的贡献和深远的影响。

บทสรุปสำหรับผู้บริหาร

การฝึกอบรมเชิงปฏิบัติการด้วยความร่วมมือระหว่างไทย - จีน ด้านเทคนิคการสำรวจและติดตามตรวจสอบเพื่อการอนุรักษ์เสือโคร่ง จัดขึ้น ณ เขตรักษาพันธุ์สัตว์ป่าห้วยขาแข้ง ตั้งแต่วันที่ 27 มีนาคม ถึง 4 เมษายน 2549

มีวัตถุประสงค์เพื่อเร่งรัดความก้าวหน้าในการริเริ่มโครงการอนุรักษ์เสือโคร่งหลายโครงการทั้งในประเทศจีนและประเทศไทย ซึ่งการฝึกอบรมในครั้งนี้เน้นการด้านการเสริมสร้างประสบการณ์ และเทคนิคด้านการปฏิบัติแก่ผู้เข้าอบรมซึ่งมีทั้งชีววิทยาภาคสนาม เจ้าหน้าที่พิทักษ์ป่า ผู้บริหารพื้นที่อนุรักษ์รวมทั้งเจ้าหน้าที่ภาครัฐจากทั้งประเทศจีนและไทย ซึ่งจะได้นำทักษะด้านนี้ไปใช้เพื่อประเมิน และติดตามตรวจสอบสถานภาพของเสือโคร่งและสัตว์ผู้ล่าขนาดใหญ่อื่นๆ รวมทั้งสัตว์ที่เป็นเหยื่อ และเพื่อกระชับความร่วมมือด้านการอนุรักษ์เสือโคร่งของทั้งสองประเทศ

การฝึกอบรมจัดขึ้น ณ สถานีวิจัยสัตว์ป่าเขานางรำซึ่งได้มีการดำเนินงานด้านการศึกษาวิจัยสัตว์ป่าระยะยาว โดยเริ่มดำเนินงานมาตั้งแต่ปีพ.ศ. 2548 เป้าหมายของการฝึกอบรมรวมทั้งเพื่อพัฒนาทักษะด้านการวิเคราะห์ที่ครอบคลุมงานภาคสนามหลายด้าน รวมทั้งเพื่อจัดทำคู่มือโครงการเพื่อสนับสนุนการดำเนินงานด้านการอนุรักษ์เสือโคร่งในหลายพื้นที่ของประเทศไทยและจีน และเพื่อจัดทำโครงการนำเสนอเพื่อประเมินสถานภาพของเสือโคร่งในพื้นที่ทางตอนใต้และตะวันตกเฉียงใต้ของประเทศไทย และในพื้นที่อนุรักษ์อีกหลายแห่งในประเทศไทยที่ตั้งอยู่ในบริเวณเทือกเขาตะนาวศรี

จำนวนผู้เข้าอบรมทั้งหมดมี 16 คนที่มาจากประเทศจีน และอีก 8 คนมาจากประเทศไทย และอีก 8 คนเป็นผู้เจ้าหน้าที่ภาคสนามของเขตรักษาพันธุ์สัตว์ป่าห้วยขาแข้ง ซึ่งช่วยทำหน้าที่เป็นวิทยากรภาคสนามให้แก่ผู้เข้าอบรม นอกจากนี้วิทยากรอื่นๆที่มาร่วมการอบรมในครั้งนี้ 6 ท่าน มาจากกรมอุทยานแห่งชาติ สัตว์ป่า และพันธุ์พืช สมาคมอนุรักษ์สัตว์ป่า และมหาวิทยาลัยมินเนโซต้า สหรัฐอเมริกา และวิทยากรอีก 2 ท่านมาจากเขตรักษาพันธุ์สัตว์ป่าห้วยขาแข้ง

หัวข้อในการฝึกอบรมตลอดระยะเวลาเจ็ดวัน มีดังนี้

- การใช้เครื่องมือวัดพิภพทางภูมิศาสตร์ การเก็บรวบรวมข้อมูล และการจัดการข้อมูลด้านภูมิศาสตร์
- การจำแนกร่องรอยสัตว์เลี้ยงลูกด้วยนม และการจัดทำเอกสาร
- การเลือกวิธีการสำรวจ
- การสำรวจทั่วไป
- การสำรวจโดยวิธีการนับกองมูล
- การติดตั้งกล้องดักถ่ายภาพ
- การวิเคราะห์มูลสัตว์ผู้ล่า
- การจับเสือและการวางยาสลบ
- การคิดปกคอกที่สื่อสาร โดยคลื่นวิทยุ โดยเครื่องมือวัดพิภพทางภูมิศาสตร์และโดยผ่านดาวเทียม :
วิธีการศึกษาวิจัยด้านนิเวศวิทยาและการติดตามตรวจสอบ
- การวิเคราะห์และติดตามตรวจสอบถิ่นอาศัยของเสือโคร่ง
- การจัดการพื้นที่เพื่อการอนุรักษ์เสือโคร่ง
- การจัดการระบบนิเวศวิทยา
- ปรับปรุงและจัดทำคู่มือการอนุรักษ์เสือโคร่งเพื่อใช้ในหลายๆพื้นที่

ผู้เข้าร่วมฝึกอบรมและผู้จัดเห็นว่าการดำเนินงานเป็นไปด้วยดีและประสบความสำเร็จ และนอกจากจะสามารถบรรลุผลตามที่คาดหวังแล้ว ผู้เข้าอบรมยังได้มีโอกาสได้แลกเปลี่ยนประสบการณ์การทำงานระหว่างกันและกันซึ่งจะเป็นประโยชน์ต่อการกระชับความสัมพันธ์และประสานความร่วมมือในอนาคต

ทักษะและข้อคิดเห็นที่ได้จากการฝึกอบรมในครั้งนี้จะได้นำไปใช้เพื่อพัฒนาวิธีการด้านการอนุรักษ์เสือโคร่งในพื้นที่ดำเนินงานต่างๆทั้งในประเทศจีนและไ
ทย

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INTRODUCTION

The purpose of this workshop was to accelerate the progress of several tiger conservation initiatives in China and Thailand by providing training and practical experience for Chinese and Thai field biologists, rangers, protected areas managers, and other government officers in the techniques required to assess and monitor the status of tiger and other large carnivores and their prey base. For participants from sites in southwest China, the main goal was to develop the skills needed to effectively carry out field surveys for tigers and assess the status of potential habitat. For participants from southern China—where a long-term tiger reintroduction project is underway, the emphasis was on habitat and prey base assessment. For participants from Thailand's western border protected areas, the goal was to provide managers and biologists with an overview of methods and skills with which to plan and carry out effective tiger conservation measures. It is hoped that these efforts will serve to demonstrate the value and importance of understanding and monitoring the status of tigers and other large carnivores throughout the region.

The format of the workshop was for participants from China to team up with their Thai counterparts to develop and test a field assessment and monitoring handbook for use in their respective projects. The Chinese participants took this task to heart—producing solid draft handbooks over the course of the workshop. These drafts drew on many tiger/wildlife handbooks in use throughout the tiger's range (Cutter et al. 1998, Rogers 1991, Karanth 2002).

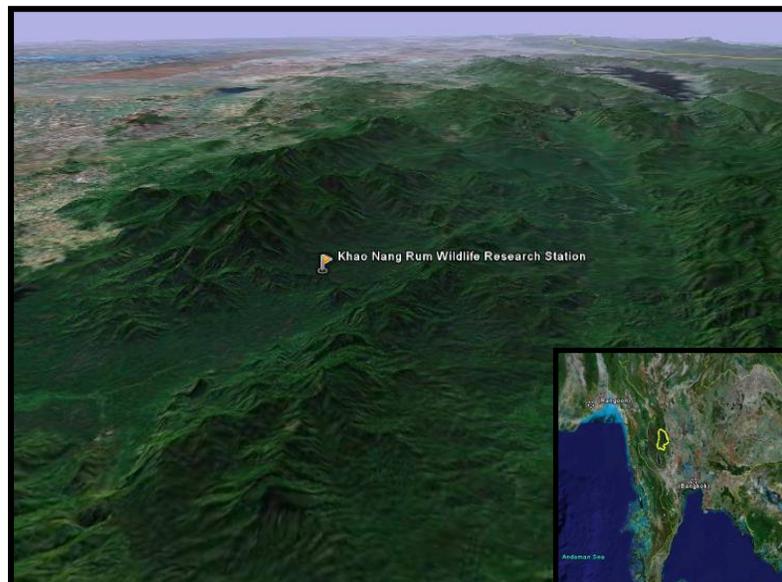
Ultimately, we will judge the workshop successful if some of the participants successfully develop projects to assess the status of tigers in the protected areas or regions in which they work. In this regard, one proposal was completed at the workshop and will be submitted to the Rhinoceros/Tiger Fund of the USFWS.

Thai participants benefited by learning and practicing specific skills that will contribute directly to survey and monitoring programs being initiated in their respective protected areas. The workshop made a significant contribution to regional tiger conservation by building the capacity of Chinese and Thai conservation professionals in terms of both skills and by further developing an active network of colleagues from which to draw technical advice and base professional collaboration.

All participants agree that this collaborative workshop has made a significant contribution to China's current initiative in developing long-term biodiversity conservation and management programs in regions of strategic biological importance.

LOCATION

The workshop was held at Khao Nang Rum Research Station at Huai Kha Khaeng Wildlife Sanctuary. Khao Nang Rum is in the core of Thailand's Western Forest Complex and is staffed by a highly experienced and skilled team of field researchers. The area around the station has a high density of tigers and tiger prey. Several of the vegetation types that form



part of the complex habitat mosaic in Huai Kha Khaeng are similar to types in southwest China. Virtually all basic methods covered in the workshop are currently being used for ongoing tiger/prey monitoring and ecological research projects at Khao Nang Rum.

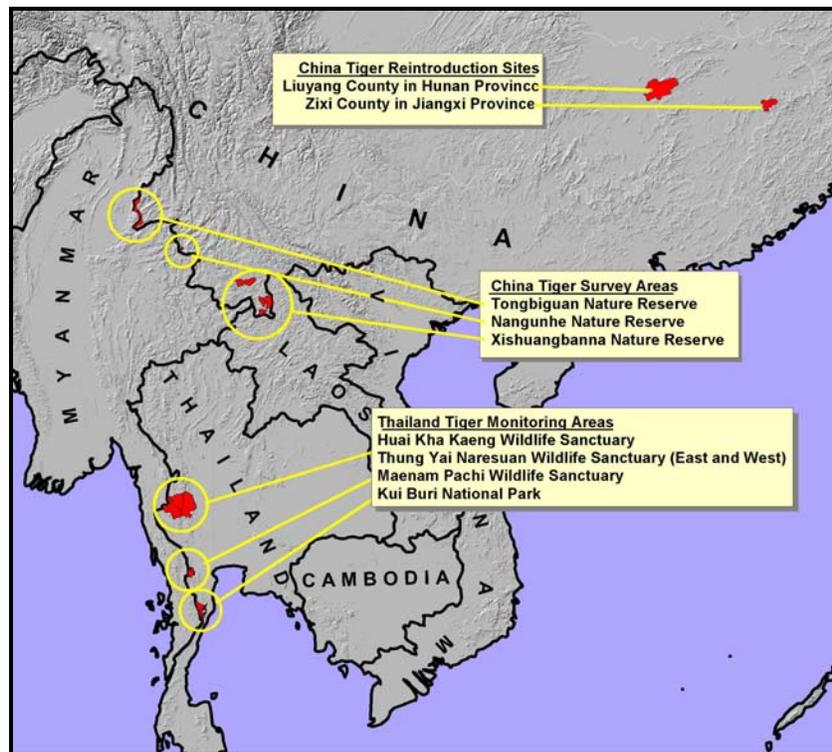
SELECTION OF PARTICIPANTS

The selection of participants from China was overseen by the SFA-China, with overall guidelines discussed and consented by UMN, SFA, and USFWS. Preference was given to personnel representing 1) parts of China where tigers are still reported to occur (i.e. parts of Yunnan province bordering Myanmar, Laos and Vietnam, and 2) sites where long-term efforts to reintroduce tigers are currently underway (Zixi County in Jiangxi province and Liuyang County in Hunan province).

Specifically, the Chinese delegation consisted of:

- (1) A team leader as assigned by SFA.
- (2) Five reserve managers and field staff representing Nangunhe, Xishuangbanna, and Tongbiguan reserves in Yunnan province.
- (3) Two staff from each of the two South China Tiger Reintroduction Project candidate sites in Hunan and Jiangxi provinces.
- (4) A representative of the provincial forestry department from each of the provinces represented (e.g. Yunnan, Hunan, and Jiangxi provinces).
- (5) Additional participants such as graduate students or project managers whose work was directly related to the workshop content.

Thai trainees were appointed by the Department of National Park, Wildlife and Plant Conservation, Thailand and consisted of officers and field technicians from sites in Western Thailand where tiger monitoring and research activities are either underway or are planned to start in the near future.



Sites represented at the workshop.

WORKSHOP OVERVIEW

The workshop combined theoretical classroom lectures, practical sessions, and field exercises to introduce course participants to the major issues and techniques relevant to tiger and tiger prey survey and monitoring activities. The ultimate goal of the workshop was to accelerate the progress of several tiger conservation initiatives in China and Thailand by providing participants with:

- knowledge and skills with which to design and carry out effective tiger and tiger prey survey and monitoring activities;
- an expanded network of like-minded professionals from which to draw support and cooperation; and
- inspiration by way of experiencing a successful tiger conservation project first hand.

The 7-day workshop consisted classroom instruction, discussion, and practical fieldwork organized around 11 major topics:

Specific topics included:

- The Global Positioning System and Collection and Management of Spatial Data
- Mammal and Mammal Sign Recognition and Documentation
- Selecting Survey Methods
- Recce - Patrol Surveys
- Pellet/Dung Count Methods
- Distance Sampling Methods
- Camera Trapping

- Carnivore Scat Analysis
- Tiger Capture and Immobilization
- Telemetry, GPS, and Satellite Collars: Ecological Research and Monitoring Approaches
- Tiger Habitat Evaluation and Monitoring

These intensive units were supplemented with evening presentations and discussions covering:

- Protected Area Management for the Conservation of Tigers
- Ecosystem Management

In addition, significant time was set aside for the production of custom handbooks to support and enhance activities associated with the various projects represented at the workshop.

INSTRUCTION UNITS AND OTHER ACTIVITIES

The Global Positioning System and Collection and Management of Spatial Data



This unit covered the basic concepts of the global positioning system (GPS), collection of data using handheld GPS receivers, and management of spatial data. The emphasis was on the practical aspects of using the GPS to support and enhance field activities. Classroom lectures lead to a field navigation exercise during which participants were challenged to collect waypoint information and demonstrate their ability to use a GPS unit for data collection and field navigation.

UTM Coordinates				UTM Coordinates			
Way-point	Survey	East	North	Habitat	Type	Notes	
格式	模式	东向坐标	北向坐标	生境	类型	备注	
W01	Trail	1179000	1700000	Forest	Trail		
W02	Trail	1180000	1700000	Forest	Trail		
W03	Trail	1181000	1700000	Forest	Trail		
W04	Trail	1182000	1700000	Forest	Trail		
W05	Trail	1183000	1700000	Forest	Trail		
W06	Trail	1184000	1700000	Forest	Trail		
W07	Trail	1185000	1700000	Forest	Trail		
W08	Trail	1186000	1700000	Forest	Trail		
W09	Trail	1187000	1700000	Forest	Trail		
W10	Trail	1188000	1700000	Forest	Trail		

demonstrate their ability to use a GPS unit for data collection and field navigation.

Mammal and Mammal Sign Recognition and Documentation

Using photos, skull and skeletal specimens, plaster casts, and scat samples from both carnivores and their prey, this unit combined powerpoint presentations with both a lab practical and an extensive field exercise. Classroom presentations covered the mechanics of large mammal and large mammal sign recognition and introduced standard techniques for recording signs during field surveys. Particular emphasis was placed on understanding the value and limitations of sign surveys.



Selecting Survey Methods: Introduction

This session presented an overview of the various methods used to survey and analyze tigers and their prey. With reference to published work and case studies, methods were explored in terms of their relevance to specific research and management questions. Other topics included the importance of utilizing preliminary data to design surveys, statistical power analysis, regional coordination, logistical and budget considerations, and common assumptions and pitfalls of the various methods discussed.

Recce - Patrol Surveys

Simple road and trail or “recce/patrol” surveys are perhaps the most commonly used method of collecting information on tigers and their prey. They are relatively easy and inexpensive to carry out and can often be combined with other activities such as enforcement patrols. Recce/patrol surveys are, however, fraught with potential bias and misinterpretation.

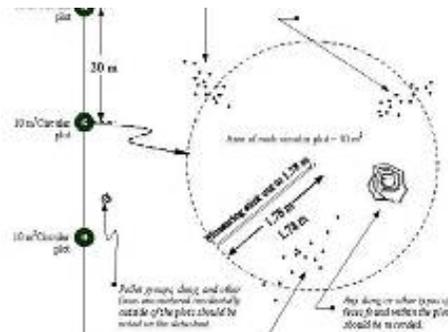


This unit presented recce/patrol methods in detail with advice on how to increase the standardization of such surveys to maximize their value for tiger research and monitoring.

To fully appreciate the value and challenges of this type of survey, 8 teams covered a total of nearly 25 kilometers employing methods and insights gained in the previous navigation and sign

recognition units. Data were then compiled, summarized and mapped as the basis for a discussion of the utility of this type of survey for addressing a number of research and management questions.

Pellet/Dung Count Methods



Pellet and dung count methods have long been used to assess and compare ungulate populations. This unit provided an overview of several widely used techniques as well as how the data collected can be effectively analyzed to address specific research and monitoring questions.

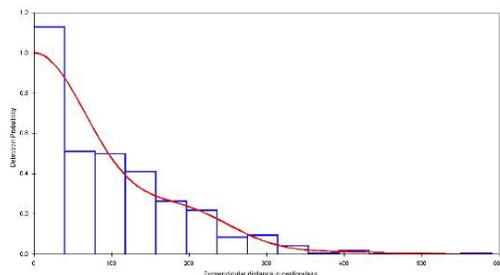
A substantial field practical session then allowed participants to take part in ongoing

pellet/dung plot survey efforts at Huai Kha Khaeng. Accompanied by experienced staff from the research station, six survey teams counted pellet groups and dung piles from various species that had accumulated in 10m² plots that had been cleared 25 days prior to the workshop. The data from over 300 such plots were then compiled and combined with average defecation rates to derive density estimates of for the various species encountered.



Distance Sampling Methods

Distance sampling methods are widely used to provide density estimates for a wide range of organisms. After a presentation of the main concepts and applications of distance sampling, participants used the newest version of the acclaimed **Distance** software to analyze sample data in the classroom. The ability to explore a dataset through a number of tabular, graphical, and summary features makes the Distance software very user-friendly.



The classroom session was followed by a field practical. After practicing using laser distance-finders, six teams walked a total of 15 kilometers of straight line transect through dry dipterocarp and mixed deciduous forest. All vertebrates (with the exception of birds) sighted along transects were noted along with the distance to the animal and angle from the baseline. Having high prey species densities, relatively open forests, and even terrain, the wide

valley below Khao Nang Rum research station provided nearly optimum conditions for the use of distance methods.

Camera Trapping

Camera traps, triggered by an animal moving through an area, are a standard in the mammal field biologist's toolbox. In this unit, a



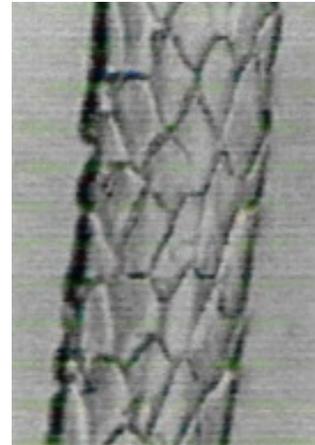
practical demonstration of different camera models, how they operate and their proper care and set-up was supplemented by a powerpoint presentation of current camera trap work taking place at Khao Nang Rum and some of the images acquired.

These classroom activities were followed by a practical demonstration of camera trap set-up in the field. Additional issues covered included a discussion of common approaches for analyzing camera-trap data, common assumptions and pitfalls, and information on the costs associated with camera trap methods.

Carnivore Scat Analysis

Over the past 6 years, Khao Nang Rum has been the base of a detailed study on tiger scat. Starting with the compilation of an extensive reference collection of materials from various tiger prey, the work has used conservative collection rules to build a large and high quality dataset of tiger scats.

In this unit, the study's primary investigator presented a detailed account of the specimen collection, preparation, and analysis methods used in this work and the results of the investigation. Materials and microscopy images from the station's reference collection provided first hand experience in identifying species from sometimes minimal remains gleaned from feces. Additional issues covered included tips for avoiding common misidentification and how scat analysis approaches can be used with other survey methods to optimize their value and relevance.



Tiger Capture and Immobilization



This unit covered capture and immobilization procedures with an emphasis on safety and minimizing disturbance to target animals. Hand-on demonstrations of equipment and video footage of recent capture, immobilization, and collaring operations at Huai Kha Khaeng provided participants with a unique look at ongoing work.

Specific topics included a review of proven capture techniques and equipment (including recently patented capture equipment developed



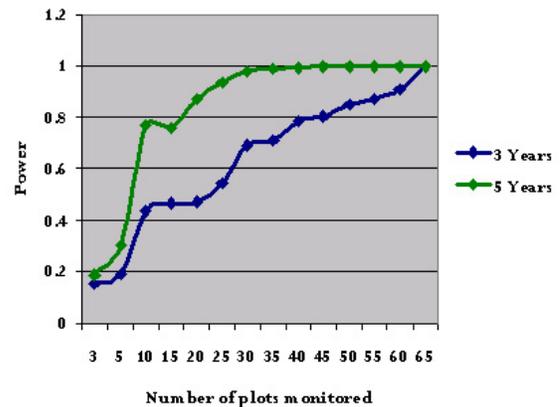
in Thailand), behavioral issues relating to tiger capture, basic handling techniques and tips, and permitting issues. Presenters included the leading tiger field researchers in Thailand.

The most common scientific goal of capturing tigers is to affix or retrieve a standard radio telemetry, GPS, or satellite transmitter collar for ecological research and monitoring. This unit also covered the technical aspects of collars and provided tips for how to get the most out of investigations using these tools.

Telemetry, GPS, and Satellite Collars: Ecological Research and Monitoring Approaches

Tiger collaring studies have provided the basis of much of our understanding of basic tiger ecology and behavior. This unit covered the many issues that should be considered when selecting collars and associated positioning systems from an ever-growing list of choices.

Additional presentations provided participants with a look at several ongoing investigations utilizing collars in Nepal, Bangladesh, and Thailand.



Tiger Habitat Evaluation and Monitoring

This unit covered the broad range of methods and tools available for evaluating and monitoring the many aspects of tiger habitat. The emphasis was on understanding the nature and dynamics of the tiger's prey base in a given area. Also covered were overviews and examples of the following:

- the essential role of statistical power analysis in designing and managing monitoring strategies;
- landcover assessment and change detection; and
- assessing and monitoring human impacts and disturbance.

Selecting Survey Methods: Review and Discussion

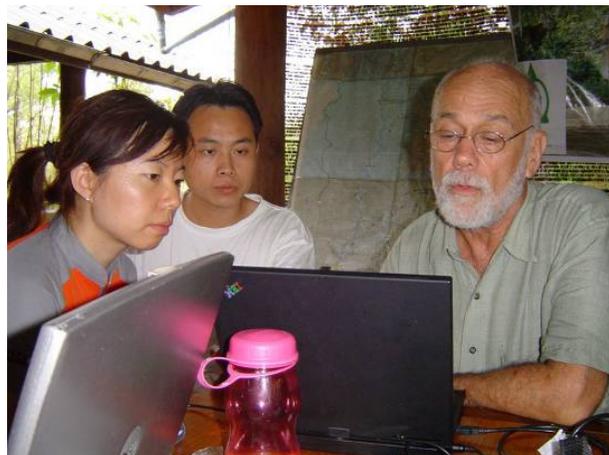
Having experienced the most commonly used tiger and tiger prey survey and monitoring methods first hand, this session focused on comparing and contrasting the various methods covered and in particular how they might be used in several tiger survey and conservation projects in China.

Producing Project Manuals

Throughout the workshop, time and resources were provided to support 3 teams in compiling a handbook of information, methods, and other resources for use in effectively carrying out planned tiger conservation work in their respective areas.

Drafting the handbooks included identifying the audience, selecting topics to be covered, compiling text and graphic resources, and laying out the handbooks.

By the close of the workshop, all teams had completed draft versions of their handbooks.



PARTICIPANT EVALUATION

Although a formal evaluation of individual participants was not carried out, the following observations summarize workshop facilitators' observations:

- Without exception, facilitators were impressed by the degree of interest displayed by participants. Notably, all participants actively and enthusiastically took part in all field activities.
- The effort of Chinese participants in developing the manual was impressive. Participants were still working on the manual at 2 AM on the last day in Bangkok which was set aside for relaxation.
- The 12 Thai DNP staff that attended the workshop were both participants and they shared their field skills with the Chinese participants.

WORKSHOP EVALUATION

A critical evaluation of the workshop consisted of discussions among both facilitators and participants addressing the strengths and weaknesses of the workshop and what changes might be made if a similar workshop were to be carried out in the future. The following summarizes the key points of these discussions:

Were the goals of the workshop satisfactorily achieved?

- Yes, although drafting / submission of additional proposals and finalization of draft handbooks is pending.

What elements of the workshop were particularly effective and why?

- Combining classroom → fieldwork practical → analysis worked well as participants could experience the methods directly and work through and evaluate an actual result
- Drafting of handbooks allowed for focused evaluation of projects and methods and good interaction among participants

What elements of the workshop were not effective and why?

- Some hardware/software technical problems limited the classroom portion of the GPS/Navigation training. However, the problems may well have mirrored some of the challenges that participants are likely to experience in the field

If offered again, how could the workshop be improved?

- Some topics deserved a bit more time to provide an effective overview. The course may benefit from being extended to a 10 day course.

RECOMMENDATIONS

Based on both structured and informal discussion among all workshop participants, the following recommendations are intended to provide direction and focus to activities supported by and/or initiated at this workshop.

1. Implement tiger and tiger prey surveys and conservation planning in Nangunhe and Tongbiguan National Nature Reserves, Yunnan, China.
2. Implement tiger and tiger prey surveys and conservation planning in the Xishuangbanna National Nature Reserve, Yunnan, China.
3. Implement ungulate recover plans for tiger reintroduction sites in Jiangxi Province, Hunan, China.

4. Expand current tiger conservation and monitoring efforts into additional areas within Thailand's Tennasserim Eco-region (the Kaeng Krachan-Kuiburi-Mae Nam Pachi and the Western Forest complexes).

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- Karanth, K.U. and J.D. Nichols (eds.) Monitoring tigers and their prey. 2002. A manual for wildlife managers, researchers, and conservationists. Centre for Wildlife Studies, Bangalore, India. 193pp.
- Rogers, W.A. 1991. Techniques for Wildlife Census in India: Field manual. Wildlife Institute of India.

APPENDIX I. WORKSHOP FACILITATORS AND PARTICIPANTS

Dr. J.L. David Smith

Professor

*Department of Fisheries, Wildlife and Conservation Biology, University of Minnesota, USA
(jlds@umn.edu)*



David is a world renowned tiger conservation biologist with field experience in nearly every part of the tigers range. His work has focused on tiger ecology and behavior, landscape-scale tiger distribution and habitat modeling; and large-scale tiger and prey monitoring. His current work also attempts to develop the capacity of both government and local people to monitor biodiversity in a participatory conservation model that includes local people as citizen “rangers”. He is the overall designer of the workshop.

Mr. Saksit Simcharoen

Chief,

Khao Nung Rum Research Station



Saksit is the leading tiger/large carnivore researcher in Thailand. He has extensive field experience on projects that range from carnivore ecology and behavior to habitat use of both carnivores and their prey. His current research is a long-term study of the ecology of the Indochinese tiger through the use of radio telemetry and GPS collaring techniques, camera trapping, and other methods.

Mr. Peter Cutter

Research Associate,

Smithsonian Institution, USA (peter@conservationasia.org)



Peter is a conservation biologist and educator with training experience in the US, Thailand, and Cambodia. After completing a landscape-scale survey of tiger and tiger prey in western Thailand, Peter has contributed to the development of Thailand’s Tiger Conservation Action Plan and has worked with Thailand’s Department of National Parks, Wildlife, and Plant Conservation to develop carnivore monitoring programs in several protected areas.

Mr. Pornchai Pathumrattanathan

Chief

Khao Pratubchang Wildlife Breeding Center, Department of National Parks, Wildlife and Plant Conservation, Thailand

(pratubchang@hotmail.com, Forestry_23@yahoo.com)



Pornchi is an expert in animal handling and capture. He has developed a variety of traps and wrist snares for birds, primates and tigers and has recently patented a unique tiger foot snare which is increasingly being used in tiger research projects in the region. Pornchi has traveled internationally as a trapping/animal handling advisor to other tiger research projects.

Dr. Anak Patanawiboon

Director

Wildlife Conservation Society, Thailand Program (anakp@wcs.org)



Anak, while working in the Wildlife Research Division of the Royal Forest Department, completed his MS and Ph.D. in Canada and the United States. He joined Thailand’s landscape-scale WEFOM conservation project in 2002 as the project’s lead ecologist. After an appointment as lecturer at Mahidol University, he was recruited to Direct the Wildlife Conservation Society’s Thailand Program.



Ms. Achara Petdee

Assistant Chief

Khao Nung Rum Wildlife Research Station Huai Kha Khaeng Wildlife Sanctuary, Thailand

In addition to other official duties, Achara is part of the Thailand Tiger Project research team. She has conducted research on tiger diet and is currently initiating a tiger prey study that will compare and critique existing methods of estimating and modeling tiger prey abundance. Achara has provided training for both Thai and American researchers at Khao Nang Rum.



Ms. Shujin Luo

Ph.D. Candidate, Research Fellow

University of Minnesota, USA (Luos@ncifcrf.gov)

Shujin is a member of the IUCN Cat Specialist Group and specializes in the genetics of Asian wild cat species. Working with numerous governments and organizations, she has facilitated a number of international collaboration efforts focused on conservation genetics. Shujin has also participated in field projects in Nepal and China, and has assisted in teaching field biology at the University of Minnesota.

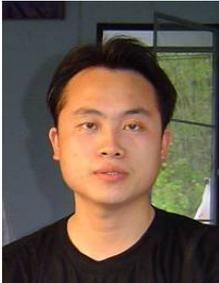


Mr. Jonathan Murray

Conservationist

Chulalongkorn University (jonathanmurray808@yahoo.com)

Jonathan is a zoologist who has been based in Thailand since 1987. Having worked at the American Museum of Natural History and as an advisor to the Zoological Park Organization of Thailand, his interests and expertise include the ecology and conservation of turtles and other reptiles, storks, small cats and other carnivores, and reintroduction efforts.



Huang Songlin

Assistant Research Investigator

National Wildlife Research and Development Center, China

(huangsonglin21@yahoo.com.cn, huangsonglin21@sohu.com)

Songlin was the leader of the Chinese delegation to this workshop. He specializes in natural reserve management, wildlife policy, and international project coordination.



Yu Changhao

Assistant Engineer

Bureau of Wild Flora and Fauna Conservation & Management, Forestry Department of Jiangxi Province, China

(cherrygy@sohu.com, cherrygy@sina.com)

Mr. Yu is a technical officer at the provincial forestry department of Jiangxi, specializing in wildlife population monitoring, reserve design and management.



Huang Biguo

*Engineer, Deputy Director
Zixi County Forestry Department of Jiangxi Province, China
(zxlyj01@vip.jx163.com)*

Mr. Huang is the leader of Zixi county forestry department in Jiangxi province and has rich experience in wildlife population monitoring and reserve management. Currently he is leading the South China Tiger Reintroduction Project at the Zixi site.



Zhang Weidong

*Senior Engineer
Zixi County Forestry Department of Jiangxi Province, China
(zhang360111@sina.com)*

Mr. Zhang is a technical engineer of Zixi county forestry department of Hunan, specializing on wildlife field population monitoring. Currently he is part of the South China Tiger Reintroduction Project team at the Zixi site.



Chen Hongchang

*Deputy Director
Department of Wild Flora and Fauna Conservation, Forestry Department of Hunan Province, China (chcc1966@tom.com)*

Mr. Chen is an international collaboration project coordinator at the provincial forestry department in Hunan, specializing in wildlife population monitoring, reserve design and management.



Xie Shaohong

*Director
Forestry Office, Liuyang Forestry Department of Hunan Province, China
(LYSBZ-288@sohu.com)*

Mr. Xie is the chief of Liuyang forestry department of Hunan and has experience in wildlife monitoring and reserve management. Currently he is leading South China Tiger Reintroduction Project efforts at the Liuyang site.



Chen Xushen

*Engineer
Forestry Office, Liuyang Forestry Department of Hunan Province, China
(LYSBZ-288@sohu.com)*

Mr. Chen is a technical engineer of Liuyang forestry department in Hunan, specializing in wildlife survey and reserve management.



Zi Shize

Engineer

*Wildlife Conservation Office, Yunnan Provincial Forestry Department, China
(zishize@163.com)*

Mr. Zi is an international collaboration project coordinator at the provincial forestry department of Yunnan. His duties include supervising biodiversity survey and monitoring projects, reserve design and management, and international project coordination.



Yang Shaobing

Director

Nangunhe National Nature Reserve of Yunnan, China

Mr. Yang served as the director of the Department of Human Resources for the Cangyuan County government before beginning his current appointment as director of Nangunhe Reserve in June 2005. .



Zhou Bing

Deputy Director

Nangunhe National Nature Reserve of Yunnan, China (cyxzb808@sina.com)

Mr. Zhou began work at the Nangunhe Reserve in December 2002 and currently serves as the head of the County Forestry Policy Department. He is experienced in anti-poaching efforts, patrolling, and reserve management.



Wang Zhisheng

Engineer

Nangunhe National Nature Reserve of Yunnan, China

Mr. Wang is the director of the Science and Research Office at the Nangunhe Reserve. He began to work at the Reserve in 1983 and is currently directing biodiversity survey and monitoring work at the reserve. He has participated in numerous workshops, training courses and conferences, and has coordinated several international collaboration projects at the reserve.



Dong Yonghua

Engineer

Xishuangbanna National Nature Reserve of Yunnan, China

Mr. Dong is a zoologist based at the Science and Research Office at the Xishuangbanna Reserve. He began wildlife field research at Xishuangbanna in 1980 and is currently coordinating biodiversity survey and monitoring efforts at the reserve. He has participated in various training workshops and conferences.



Yang Yonghui

Assistant Engineer

Tongbiguan Nature Reserve of Yunnan, China (yyh7777@163.com)

Mr. Yang is the director of Tongbiguan Reserve, specializing in wildlife monitoring, wild plant conservation, reserve design and management.



Zhang Lin

Program Assistant

Wild Training Program For South China Tiger, China (tigerzl@vip.sina.com)

Ms. Zhang is the project coordinator of the Wild Training Program for the South China Tiger Reintroduction Project. While in Thailand she has developed expertise in identifying and mapping tiger scent marks.



Feng Limin

Ph.D. Student

Beijing Normal University, China (fengliminye@163.com)

Limin conducted his M.S. research project on Asian elephants in Yunnan and has field experience in camera trapping and ecological survey of mammals. He is also experienced with 3S (GIS, GPS, and RS) techniques.



Cao Qing

M.S. student

Beijing Forestry University, China (william_caoqing@msn.com)

Cao Qing (William) is conducting his M.S. research project on the behavior of tigers in captivity. He has participated in other international workshops and has experience in biological and behavioral research techniques and in carrying out tiger field surveys.



Montri Khaengkhetkarn

Assistant Chief

Thung Yai Wildlife Sanctuary-West, Thailand

Montri came to the workshop to learn about tiger and tiger prey monitoring techniques in preparation for conducting tiger surveys in Thung Yai Wildlife Sanctuary. He will work with Saksit next year when the Thailand Tiger Project expands its activities to Thung Yai.

Poch Tabpratoom

Assistant Chief

Mae Nam Pachi Wildlife Sanctuary, Thailand

Poch came to the workshop to learn about tiger and tiger prey monitoring techniques. He plans to send additional staff to train with the Khao Nang Rum team as the first step in initiating ongoing tiger monitoring efforts in Maenam Pachi Wildlife Sanctuary.



Wanlop Chutipong

Field Project Officer

WWF Thailand Programme, Thailand (wunlop@wwfthai.org)

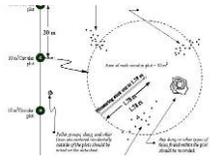
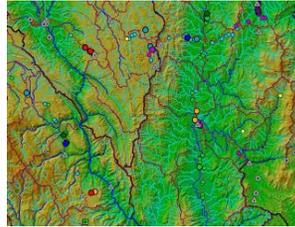
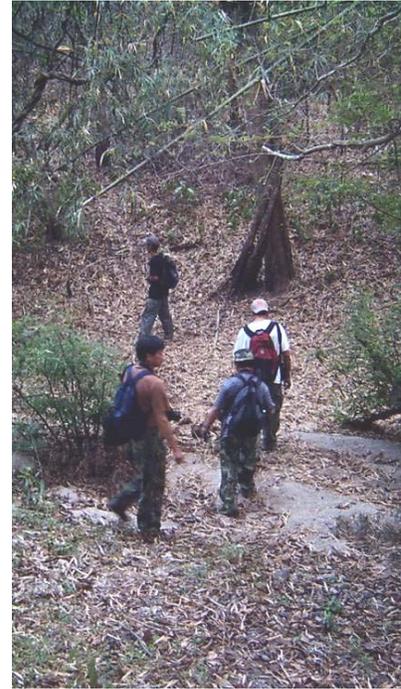
Wanlop has several years experience conducting tiger and bear surveys in protected areas in the Tennasserim Ecoregion. He is currently carrying out a research and capacity building project focused on monitoring the status of tigers and their prey in Kuiburi National Park.

APPENDIX II. WORKSHOP SCHEDULE

Date		Activity / Topic(s)
25 March (Saturday)	PM	<i>Arrive Bangkok, Welcome Dinner in Bangkok</i>
26 March (Sunday)	AM	<i>Travel to Khao Nung Ram Wildlife Research Station</i>
	PM	Settle into accommodations / Afternoon Orientation Walk
	Evening	<i>Presentation:</i> Conservation Efforts at Huai Kha Khaeng Wildlife Sanctuary
27 March (Monday)	AM	Designing and Planning Survey and Monitoring Efforts
	PM	Wildlife/Wildlife Sign Interpretation
	Evening	<i>Presentation/Discussion:</i> Integrating Research, Conservation, and Outreach for Effective Tiger Conservation
28 March (Tuesday)	AM	Global Positioning System and Spatial Data Management Introduction to Recce – Patrol Surveys
	PM	<i>Field Practical:</i> Recce – Patrol Surveys
29 March (Wednesday)	AM	Introduction to Distance Sampling Methods
	PM	<i>Field Practical:</i> Distance Sampling
	Evening	<i>Presentation:</i> <i>Current Tiger Research at Khao Nung Rum Research Station</i>
30 March (Thursday)	AM	Tiger Capture and Immobilization Techniques Camera Trapping Techniques
	PM	<i>Field Practical:</i> Combined Pellet/Dung Distance and Plot/Removal Surveys
	Evening	Work on Project Manuals and Proposals
31 March (Friday)	AM	Radio Telemetry / Satellite Tracking Techniques and Case Study
	PM	Carnivore Scat Analysis Techniques and Case Study Recording Wildlife Sign: Photographs, Plaster Casts, and Other Methods Work on Project Manuals and Proposals
	Evening	<i>Presentation and Discussion:</i> <i>Ecosystem Management</i>
1 April (Saturday)	AM	Survey and Monitoring Method Selection
	PM	Work on Project Manual <i>Reception at Khao Nang Rum Valley Overlook</i>
2 April (Sunday)	AM	Overview of Global Tiger Conservation
	PM	<i>Return to Bangkok / Closing Banquet</i>
3 April (Monday)		<i>Free Day</i>
4 April (Wednesday)		<i>Return Flights to China</i>

APPENDIX III. PHOTOS





APPENDIX IV. DRAFT FIELD SURVEY HANDBOOK (SEPARATE DOCUMENT)

