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# PROYEK PENYELAMATAN HARIMAU SUMATERA

~ SUMATRAN TIGER PROJECT ~

## TAMAN NASIONAL WAY KAMBAS, INDONESIA

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AUG - 5 1996

*Department of Forest Protection and Nature Conservation (PHPA) ~ Taman Safari Indonesia (TSI)  
IUCN CBSG Tiger Global Animal Survival Plan & Minnesota Zoo ~ Indonesian Institute of Sciences (LIPI)*



### FOURTH QUARTER PROGRESS REPORT: JUNE 1996

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## **SUMATRAN TIGER PROJECT:**

### **FIELD STUDY IN WAY KAMBAS NATIONAL PARK**

#### **FOURTH QUARTER PROGRESS REPORT: JUNE 1996**

**Period from April - June 1996**

Submitted to

Lembaga Ilmu Pengatahuan Indonesia (LIPI)  
Kepala Biro Kerjasama Iptek

*Save the Tiger Fund*, National Fish and Wildlife Foundation, USA

Submitted by

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in collaboration with

Directorate Jeneral Perlindungan Hutan dan Pelestarian Alam (PHPA)  
Ir. Dwiatmo Siswomartono, Director for Nature, Flora and Fauna Conservation  
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Drs. Jansen Manansang, Director of TSI & PKBSI Sumatran Tiger Co-Coordinator  
IUCN/SSC Conservation Breeding Specialist Group (CBSG)  
Universitas Indonesia (UI)  
Universitas Lampung (UNILA)

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**The Sumatran Tiger Project is supported by *Save the Tiger Fund* (a program of the National Fish and Wildlife Foundation in partnership with the Exxon Corporation), ESSO U.K., ESSO Indonesia, Taman Safari Indonesia, London Zoo and the Zoological Society of London.**

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Letters Regarding Project Activities

## SUMATRAN TIGER PROJECT: OVERVIEW

### Introduction

The endangered status of the Sumatran tiger (*Panthera tigris sumatrae*) is now well recognized around the world, with an estimated population of 400-500 remaining in the wild (*IUCN/SSC CBSG Sumatran Tiger PHVA Report*, 1994) and approximately 240 Sumatran tigers maintained *ex situ*. In recognition of the situation the Indonesian Government has attempted to prioritize the steps necessary for the species effective conservation, and these have been formalized in the Ministry of Forestry's (PHPA) far-sighted document, the *Indonesian Sumatran Tiger Conservation Strategy* published in 1994.

There are four general categories of recommendations that comprise the *Indonesian Sumatran Tiger Conservation Strategy* to ensure the long-term survival of Sumatran tigers throughout their remaining range. One category includes the initiation of field programs for ecological studies of the Sumatran tiger, the long-term monitoring of wild tiger populations over their entire range in Sumatra, and the establishment of criteria to resolve conflicts between tiger populations and surrounding human settlements. It is these aspects of the tiger's conservation that we hope to address within the framework of this project.

### Project Objectives

The objectives of this long-term field study of wild Sumatran tigers in Way Kambas National Park are:

- to develop a cost-effective tiger monitoring system (using ground-based census counts, remote camera census, and radiotelemetry);
- to collect data on tiger ecology and life history characteristics in order to develop long-term conservation management strategies for wild populations of tigers in Sumatra;
- to resolve human-tiger conflicts, to develop viable, productive resource sharing, and to start up community-based tiger education programs; and
- to train university and PHPA counterparts to become future conservation leaders in Indonesia.

### Collaborating Institutions

The Sumatran Tiger Project located in Way Kambas National Park is a collaborative research effort between the Tiger Global Animal Survival Plan (GASP) under the Conservation Breeding Specialist Group (CBSG) of the World Conservation Union (IUCN) and the following Indonesian agencies: Lembaga Ilmu Pengatahuan Indonesia (LIPI); the Directorate Jeneral Perlindungan



Hutan dan Pelestarian Alam (PHPA); the CBSG Indonesia Program at Taman Safari Indonesia (TSI); the Universitas Indonesia (UI); and the Universitas Lampung (UNILA). The project is administered through the Minnesota Zoo, USA.

## **Sponsors**

The Sumatran Tiger Field Study in Way Kambas National Park was initially funded by ESSO U.K. and now receives primary support from the *Save the Tiger Fund*, a special project of the National Fish and Wildlife Foundation in partnership with Exxon Corporation. Additional support is being provided by the CBSG Indonesia Program at Taman Safari Indonesia, ESSO Indonesia, the Zoological Society of London through the London Zoo and the Minnesota Zoo.

## **Overview of Project Activities: Fourth Quarter**

This fourth quarter report of the Sumatran Tiger Project contains information from the field study of tiger ecology, which began in June 1995, and from the community conservation and education program, which began in December 1995. This report covers the period of 1 April to 30 June 1996. Previous quarterly reports about the project are listed below.

*First Quarter Progress Report: Administrative Phase*  
(1 June to 15 July 1995, submitted 15 September 1995)

*Second Quarter Progress Report: Six-Month Summary*  
(1 July to 31 December 1995, submitted 31 January 1996)

*Third Quarter Progress Report*  
(1 January to 31 March 1996, submitted 10 May 1996)

## **TIGER FIELD ECOLOGY PROGRAM**

### **Progress Report: April to June 1996**

The Tiger Field Ecology Program of the Sumatran Tiger Project is based upon recommendations set forth in the *Indonesian Sumatran Tiger Conservation Strategy* published in 1994 by the Indonesian Directorate General of Forest Protection and Nature Conservation (PHPA), Ministry of Forestry. This strategy formally outlines the steps necessary to develop and sustain a conservation program that will ensure the long-term viability of wild Sumatran tigers. The field ecology program addresses the need for information about the natural history of wild Sumatran tigers and is one of the programs which comprise the *in situ* component of the Sumatran Tiger Project, directed by Dr. Ronald Tilson, Project Director (LIPI Surat Izin Penelitian No.

3361/I/KS/1995) and IUCN/SSC CBSG Tiger Global Animal Survival Plan (GASP) Coordinator. The Coordinator for all aspects of the Field Ecology Program is Neil Franklin (LIPI Surat Izin Penelitian No. 3361/I/KS/1995). Other necessary permits for both researchers are contained in the *First Quarter Progress Report* (1995). Two Indonesian research staff are Sriyanto (Tiger Prey Species study) and Bastoni (Remote Camera Systems study), who are permanent project staff. Various University of Lampung (UNILA) students are participating; each spends one month in orientation and then, after developing a research proposal, return for a three-month period under UNILA sponsorship.

### **Biological Results and Outputs**

Biological results from the period of this quarterly report originate from the outputs of the remote camera systems that were placed throughout the national park. This remote camera census was concentrated initially within the Way Kanan Resort of Way Kambas National Park (see *Field Study Progress Report: Six-Month Summary* and Map 1), though several cameras were also placed south of the Way Kanan river in order to investigate whether the river represented a significant barrier to tiger movement and territory holding capacity. Early results from these cameras have shown that tigers are indeed crossing the river, and thus it is likely that some tigers have permanent home ranges that fall either side of this main river (see Map 2).

The initial field site near Way Kanan Resort was selected as the most appropriate site for the long-term monitoring of wild tigers in Way Kambas. For this reason, we now refer to this site as the Tiger Intensive Monitoring Area (TIMA). Cameras operating within this site have ranged from 12 to 28, with 25 of these cameras currently operating. These cameras are intended to run for a period of approximately two years at the minimum, and will allow several tiger individuals to be monitored over extended periods. Birth intervals for resident females might be noted. Cameras will be checked every seven days, with camera batteries changed every two weeks, and logger batteries changed every month.

Several mammalian species were recorded during the fourth quarter that had not been previously noted (see **Section 2, Press Releases**). The field program was initiated in June 1995, remote camera censusing was initiated in September 1995, and the first tiger was photographed in November 1995. A total of ten tigers have been positively identified. Two other tigers have been photographed but not identified. Three different adult females with cubs following them were observed by park staff, but until these tigresses are photographed or observed by project staff, the accounts will remain as unverified antedotal information.

Tiger prints have been regularly encountered in all areas of the TIMA as well as other areas. Clear prints were recorded by tracings made on acetate sheets, and filed with their GPS latitude and longitude. Comparisons between print sets of different individuals were facilitated in this way. All other tiger secondary signs were recorded and incorporated into the GIS map of the park by latitude and longitude. Tiger feces samples have now accumulated to 32 and are ready



for preliminary analysis by comparison with reference hair collection obtained from Taman Safari Indonesia (zoological park).

Preliminary home ranges for several of the tiger individuals obtained by the remote camera census have been constructed, though it is likely that these preliminary home ranges will change dramatically as the results from the TIMA camera system accumulate.

Program objectives achieved during the fourth quarter (for a complete explanation of the methodology for establishing these objectives, refer to the *Third Quarter Progress Report*) are:

- Tiger Intensive Monitoring Area established and mapped on GIS
- System of patrol trails in the TIMA opened, mapped and marked
- Remote forest camps constructed in the TIMA, facilitating logistics of teams
- Camera system set up in the TIMA for permanent monitoring (25 cameras)
- Patrol routes regularly monitored by mobile teams
- Tiger secondary signs in the TIMA recorded and mapped on the GIS
- Tiger print inventory initiated
- Vegetation and habitat distribution mapping for TIMA area initiated
- Tiger feces collection continues (32 samples)
- Tiger feces reference collection analysis initiated for prey selection study
- Elephant team from PLG (total 15 personnel) used within the park for logistic support
- Elephant team from PLG used for transport of wood and tools for tree camp construction

Sumatran Tiger Project staff, PHPA support staff and University of Lampung students that participated in field activities include:

Neil Franklin (York University, UK)	Field Ecology Coordinator
Bastoni	Remote Camera Systems Study
Sriyanto (IPB)	Tiger Prey Species Study
Muhamad Yunus and Agus Subagyo (UNILA)	S1 orientation and proposal development
Mukhlisin	PHPA Way Kanan Resort Chief
Marjono	Base-camp logistic support
Apriawan, Dedy, Sudrajat, Sujoko, Darmiawan, Dani and Suhadi	PHPA research support staff
PLG Security (x2)	PHPA Elephant Training Center staff
PLG elephant drivers (x3)	PHPA Elephant Training Center staff
Elephants (x3)	

During the fourth quarter 355 field days were accumulated by project staff. This included a six-day period where 15 personnel were used during the construction of the remote forest base camps.



# Way Kambas National Park

Sumatran Tiger Project GIS



Penyusutan Camp (July 1980)

Reserve Boundary

## Legend

- Dense Forest
- Guard Posts
- Mixed Grass-Forest
- Old Roads and Trails
- Open Forest
- Open Grassland
- Proposed Camera Sites
- Proposed Video Sites
- Quarter Degree Lines
- Remote Camera Sites
- Rivers - Medium
- Roads



### **Training Opportunities for UNILA Students**

During the third quarter the Rector of the University of Lampung was approached and discussions were held regarding the use of UNILA students in the Sumatran Tiger Project (see *Field Study Progress Report: Six-Month Summary for names and specifics of discussions*). We intend to continually incorporate students into the project for brief orientation and training periods. This will allow students to become familiar with methodologies used by project staff and field conditions in the forest, and how to develop appropriate personal research projects compatible with the overall mission of the Sumatran Tiger Project.

During the fourth period two students from the University of Lampung (UNILA), Muhamad Yunus and Agus Subagyo, were incorporated into the project for an orientation and training period. This allowed the two students in question to familiarize themselves with the methodology used by the project, familiarize with field conditions, and construct and develop personal research projects. Personal research projects will form the thesis component of S1 degree in Biology at the University of Lampung, and began following the four-week orientation period.

The syllabus for the orientation period is as follows:

- Geographic Information System (GIS)
- GIS operation
- Remote camera system operation
- Ecology of tigers in the field
- Signs of tigers in the field
- Line transect surveys for tiger prey
- Orientation to TIMA (Tiger Intensive Monitoring Area)
- Ecology of other animals in the field

### **Tiger Ecology Program Plans for Next Quarter: July to September 1996**

During this time field researchers will concentrate on the following objectives:

1. The team will conduct more extensive site surveys and ground-truth for landscape ecology using a computer based Geographic Information System (GIS) and Global Position System (GPS) of the park. Vegetation-type zonation will be a priority, as will the collection of information relating to the presence and distribution of tigers within the Tiger Intensive Monitoring Area and secondary census sites across the park.
2. Permanent ground-based transect lines from 1-4 km in length will be established for estimating tiger prey-base densities in different habitat types, and will be maintained and regularly monitored through the study. These data will permit comparisons with remote camera trap data for density estimation evaluation, as well as a cost-analysis of the

methodology. The incorporation of elephants as a vehicle for conducting these transect censuses will be investigated.

3. The tiger prey species analysis using hair samples will be fully initiated in the TIMA and compared to other sites established as part of the project. A reference hair collection will be obtained from Taman Safari Indonesia to facilitate this analysis.
4. A third remote forest camp will be constructed in the TIMA to facilitate logistics of the staff working in the area and protecting them from wild elephants while camping overnight. A radio communication network will link these remote sites to PHPA and to the project base camp.
5. The incorporation of additional students and university staff from Lampung University will be pursued. We intend to have individual research projects performed by these students as a component of the overall mission of the Sumatran Tiger Project. Two UNILA students will begin their three-month field projects. One will focus on comparing tiger prints with known photographs of individual tigers, and the other will observe behavior patterns of sambar deer, one of the primary prey species of tigers.

## COMMUNITY CONSERVATION AND EDUCATION PROGRAM

### Progress Report: April 1996 to June 1996

The Community Conservation and Education Program (CCEP) of the Sumatran Tiger Project is based upon recommendations set forth in the *Indonesian Sumatran Tiger Conservation Strategy* published in 1994 by the Indonesian Directorate General of Forest Protection and Nature Conservation (PHPA), Ministry of Forestry. This strategy formally outlines the steps necessary to develop and sustain a conservation program that will ensure the long-term viability of wild Sumatran tigers in Indonesia. The CCEP addresses the critical human component of this strategy and is one of the programs which comprise the *in situ* component of the Sumatran Tiger Project. The Coordinator for all aspects of the CCEP is Philip Nyhus (LIPI Surat Izin Penelitian No. 9867/II/KS/1995). Other necessary permits are contained in *Second Quarter Progress Report: Six-Month Summary* (1995).

### Objectives

The goal of this program is to better understand park-people interactions near Way Kambas National Park (WKNP). Evaluating human resource use patterns and wildlife resource needs is an important step to establish criteria to resolve future conflicts between tiger populations and human settlements in this and other tiger protected areas in Sumatra. To accomplish this, the following objectives for this program were set:

- to model human population growth and land use trends adjacent to the park;
- to evaluate human attitudes in communities near the park;
- to document human-wildlife interactions; and
- to integrate this information with data from tiger ecology studies to develop methods to resolve human-wildlife conflicts and develop tiger conservation education strategies.

### Field Phase: April 1996 to June 1996

The Community Conservation and Education Program was initiated in December 1995, and the methodology of the program was first presented in the *Third Quarter Progress Report*.

Thus, this report contains the second quarter report of this program. The primary objectives of the second three months of field work in and near Way Kambas National Park were:

- to work with local communities to monitor human-wildlife conflicts;
- to develop and pre-test a village survey instrument to study land use, attitudes, and human-wildlife conflicts in communities near the park; and
- to cooperate with students and staff from the University of Lampung on project activities.

### Human-Wildlife Conflicts

Eighteen informants in twelve villages were contacted with the help of the respective village leaders (*kepala desa*) to help document the frequency, location, and impact of wildlife leaving the park. Some villages with long borders and/or more than one *dusun* bordering the park have more than one informant collecting data:

<u>Kecamatan</u>	<u>Desa</u>	<u>Informants</u>
Sukadana	Muara Jaya	1
	Rantau Jaya Udik II	3
Labuhan Maringgai	Karang Anyar	3
	Tanjung Tirto	2
Purbolinggo	Tegal Yoso	1
	Toto Projo	1
	Braja Asri	1
Way Jepara	Braja Harjosari	1
	Braja Kencana	1
	Braja Luhur	1
	Braja Yekti	2
	Labuhan Ratu VI	1
	<b>Total Informants</b>	<b>18</b>

Daily records of wildlife entering villages are recorded by these village informants with standardized reporting sheets. Informants are asked to fill out one sheet per week that contains the following information: type of wildlife leaving the park, number of animals, time and location the animals enter and leave village, extent of damage, and additional comments. The CCEP coordinator visits each informant every two to three weeks. Field observations will soon be started to cross-check the validity of these reports.

Visits were made to two villages on three occasions to observe how community members guard against elephant incursions. A night vision scope was used to better visualize night-time activities.

### **Human Encroachment**

Villagers who were knowledgeable about the park during preliminary interviews also were asked if they would be willing to escort the CCEP Coordinator into the park to identify areas where they frequently saw tigers or tiger prints. The objectives of these activities were:

- to identify areas where tigers are known to be close to villages; and
- to use these field trips to map routes frequently used by villagers who enter the park using a hand-held Global Positioning System (GPS) unit.

Villagers are legally not allowed to enter park and can face fines or jail if caught. In order to enter the park with villagers, letters were first obtained from the head of Way Kambas National Park authorizing the CCEP coordinator to enter the park alone with villagers. To encourage villagers engaged in illegal activities to assist the STP and to ensure confidentiality of the villagers, agreements were made that no Forest Protection and Nature Conservation (PHPA) officers would be present (except in one village) and normal forest patrols would be re-routed from those areas. Forest paths frequently used by villagers were surveyed and mapped with a GPS unit from four different villages: Braja Yekti, Braja Luhur, Karang Anyar, and Labuhan Ratu VI. Major paths from the villages into the park were mapped and questions about resource use inside the park were asked. Signs and locations of forest use (fires, discarded items) were noted.

### **Contacts with University of Lampung**

On 1 May 1996, the Community Conservation and Education Program (CCEP) coordinator was invited to present an informal seminar describing the activities of the CCEP in villages near the park at the University of Lampung (UNILA). The presentation was attended by the Director of Research at UNILA, Dr. Muhajir Utomo, the Dean and Assistant Dean of the Agricultural School, faculty from the departments of Biology, Sociology and Agricultural Economics, and interested students. Contacts were made to arrange students to work with STP staff on the up-coming



community surveys. Positive meetings were held with the Rector, the Director of Research, and several faculty members during a visit in mid-April to coordinate these activities. This cooperation will hopefully provide the framework for a mutually beneficial relationship between STP and UNILA in the coming months and years.

Two students, Mr. Rahmat Asri and Mr. Wahudi, from the UNILA Faculty of Agriculture began working with the CCEP in May. These students helped to develop and pre-test the village survey (see below). The students were encouraged to help to write, edit, test, and analyze the survey. It is hoped that these activities will help the students develop and implement their own independent research projects for their individual university requirements.

### **New Field Sites Started**

Two meetings were held with the office of the *Kecamatan* of Purbolinggo, located on the western border of the park, to ask their help notifying village leaders in the 6 villages in that sub-district that border the park that we may conduct research activities in their areas. Introductions were made with the *kepala desa* of the villages of Tanjung Trito and Toto Projo. Preliminary village surveys were conducted in these two villages by meeting with groups of farmers and village leaders. These meeting largely followed the format use during preliminary surveys in other villages (see first sixth month report for details). Tanjung Tirta was targeted because a villager was killed by tiger last year while collecting grass inside the park. Villagers PHPA staff escorted the CCEP coordinator to the area inside the park where the tragedy occurred. This village also is unique because it is one the few areas where forested park land is adjacent to village land.

### **Village Surveys**

A survey instrument for the STP village survey was written by the CCEP coordinator and translated by a Dr. Bustanul Arifin, a faculty member at UNILA. The 12-page survey consists of four major sections: 1) background information; 2) land and resource use inside and outside the park; 3) human wildlife conflicts; and 4) knowledge and attitudes about wildlife (particularly tigers), Way Kambas National Park, and forest protection staff. Photos of animals taken by STP cameras within the park also are used to study the awareness of villagers about park tigers and other park wildlife. The questions were based on data and hypotheses developed during the preliminary studies undertaken during the first three months of field work (see Appendix I, *Sumatran Tiger Project Survey Desa 1996*).

The questionnaire underwent a rigorous pre-test and pilot study in three different villages. More than 30 households were interviewed during the pre-test to edit existing questions and to develop new questions. Local community members were asked to provide input on ways to make the questions more understandable to villagers with little or no schooling. A pilot test was undertaken with approximately 25 households to test the relevance and validity of some of the



questions, further refine and edit questions, test the field methods, and to provide an opportunity for the interviewers (CCEP Coordinator, two students from UNILA, and a recent graduate of UNILA who is also the son of a local village leader) to gain experience. These activities were time consuming but were considered essential to reduce the number of problems when the actual survey starts the first week of July. The survey underwent more than five major revisions and numerous smaller changes. The *Sumatran Tiger Project Survey Desa 1996* is now ready to be administered in target villages (see Appendix I).

### **Appreciation to Village Leaders**

To express appreciation for the help the STP has received from village leaders, a one-day orientation session was undertaken at the Way Kanan Field station. Four *kepala desa* and their families were able to attend the half-day event. The Director of the STP and project staff provided brief overviews of STP activities inside and outside the park. The village leaders were treated to a boat trip on the Way Kanan River, provided a meal, and given complimentary Asian Tiger Fund calendars in appreciation of their assistance.

### **Summary of CCEP Activities: April 1996 to June 1996**

The following major activities were undertaken by the Community Conservation and Education Program of the Sumatran Tiger Project through 30 June 1996:

1. Eighteen informants in twelve villages have started collecting information to document the frequency, location, and impact of wildlife leaving the park.
2. Forest treks were made with villagers from four villages to look for areas where tigers have been sited near villages, to map frequently-used forest trails, and to collect information on forest use.
3. Contacts with the University of Lampung were strengthened, a seminar about the CCEP was presented, and two students began working with the CCEP Coordinator.
4. Two new field sites were started in the *Kecamatan* of Purbolinggo. The village of Tanjung Tirto is considered important because a villager from that village was killed by a tiger last year.
5. A 12-page questionnaire was written, translated, and edited. A pre-test with 30 households and a pilot test with 25 household were completed in three different villages. The survey is now completed and ready to be administered.

### **CCEP Plans for Next Quarter: July 1996 to September 1996**

During this time the field researchers will target eight villages (approximately 100 household per village) to administer the *Sumatran Tiger Project Survey Desa 1996*. Additional students from the University of Lampung will be incorporated into the project to administer the survey and to work on their own independent project. Forest treks with villagers are planned to be undertaken in two more villages and passive and active trail monitors will be set up in several locations to remotely monitor trail use. Villager use of park wetland areas will be monitored and human-wildlife conflict report checked. Data collection for a GIS map of communities near the park will commence. A draft survey to be administered to PHPA staff to compare forest staff attitudes and knowledge with those of villagers will be written.

### **Acknowledgements**

The Sumatran Tiger Project acknowledges with gratitude the help and support of all individuals and organizations mentioned in this report. We are particularly thankful to Bapak Dwiatmo Siswomartono, PHPA and Bapak Jansen Manansang, TSI for all of their support and guidance as our Indonesian counterparts. We are pleased to have as our sponsors in Indonesia Lembaga Ilmu Pengetahuan Indonesia, and as research colleagues Perlingdungan Hutan Perlistarium Alam, and Universitas Lampung, and as our secretariat Taman Safari Indonesia. We sincerely appreciate and thank ESSO U.K. for initial funding of this project, and the *Save the Tiger Fund* for ensuring continued support of the project. We are also grateful to ESSO Indonesia, London Zoo, Zoological Society of London, Taman Safari Indonesia, and Minnesota Zoo for their generous support.

### **Project Reporting to Indonesian Sponsors**

This report constitutes the fourth quarter progress report as required by LIPI for researchers in Indonesia. Six copies are presented to the Head of the Bureau of S&T Cooperation in Jakarta. In addition, copies of this report have been mailed to collaborating and sponsoring institutions, both within and outside of Indonesia.

Soemarsono, Director General of PHPA, Jakarta  
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# Survey Desa 1996

## Sumatran Tiger Project

Taman Nasional Way Kambas  
Lampung Tengah, Sumatera, Indonesia

Selamat pagi/siang/sore! Nama saya \_\_\_ dari \_\_\_. Kami sedang melakukan survey desa tentang sikap dan perilaku manusia, dan hubungan antara manusia dengan satwa di sekitar Taman Nasional Way Kambas. Kami datang ke rumah Saudara, yang kebetulan terpilih secara acak. Kami mohon bantuan Saudara menjawab beberapa pertanyaan kami dengan jujur dan terbuka. Jika diperbolehkan kurang lebih akan makan waktu 1 jam.

□□-□□-□□-□□-□□-□□-□□
Kec. Desa Dusun Bulan Hari inisial Nomor
Number Entered: □□□□
Kecamatan: _____
Desa: _____
Dusun: _____
Tgl. Wawancara: _____
Pewawancara: _____
Nomor: _____ Waktu wawancara dimulai: _____
Version: 9 July, 1996 Date Entered: □□-□□-□□

### A. Informasi Dasar

- Siapa nama Saudara?: \_\_\_\_\_ v001
- Status Saudara di keluarga? v002
  - Kepala keluarga  01
  - Isteri  02
  - Anak  03
  - Lainnya (Sebutkan): \_\_\_\_\_  04
- a. Sejak tahun berapa Saudara tinggal di desa ini?  
19□□ v003  
b. Alasan mengapa tinggal di desa ini (Sebutkan):  
\_\_\_\_\_ v004
- a. Sejak tahun berapa Saudara tinggal di Lampung?  
19□□ v005  
b. Alasan mengapa tinggal di Lampung: v006
  - Lahir di sini  01
  - Ikut orang tua  02
  - Transmigrasi (Sebutkan): \_\_\_\_\_  xx
  - Lainnya (Sebutkan): \_\_\_\_\_  xx
- Daerah asal Saudara (PULAU dan PROPINSI):
  - Saudara: \_\_\_\_\_ v007
  - Bpk. Saudara: \_\_\_\_\_ v008
  - Ibu Saudara: \_\_\_\_\_ v009

- Apakah status perkawinan Saudara? v010
  - BELUM MENIKAH  01
  - MENIKAH  02
  - BERCERAI  03
  - JANDA/DUDA  04
  - LAINNYA (MENJELASKAN): \_\_\_\_\_  0x

7. Jumlah anak Saudara berapa? □□ v011

8. a. Yang tinggal di rumah disini ada berapa orang?  
□□ v012

b. Mohon dijelaskan hubungan Saudara dengan, jenis kelamin dan tahun lahir orang tersebut:

#### Hubungan Dengan Saudara

Suami/Isteri, Anak, Saudara, Ibu/Ayah, dll.	Lk <sup>2</sup> Pp		Tahun Lahir
	1	2	
i. <u>Responden</u>	<input type="radio"/>	<input type="radio"/>	19□□ v013-15
ii. _____	<input type="radio"/>	<input type="radio"/>	19□□ v016-18
iii. _____	<input type="radio"/>	<input type="radio"/>	19□□ v019-21
iv. _____	<input type="radio"/>	<input type="radio"/>	19□□ v022-24
v. _____	<input type="radio"/>	<input type="radio"/>	19□□ v025-27
vi. _____	<input type="radio"/>	<input type="radio"/>	19□□ v028-30
vii. _____	<input type="radio"/>	<input type="radio"/>	19□□ v031-33
viii. _____	<input type="radio"/>	<input type="radio"/>	19□□ v034-36
ix. _____	<input type="radio"/>	<input type="radio"/>	19□□ v037-39
x. _____	<input type="radio"/>	<input type="radio"/>	19□□ v040-42



9. Apa agama Saudara? V043
- a. Islam  Hindu
- b. Katolik  Budha
- c. Protestan  Lain-Lain (Sebutkan)
- \_\_\_\_\_

10. Pendidikan tertinggi yang diselesaikan (ATAU SEDERAJAT): V044
- a. Tidak Sekolah
- b. Tidak Tamat Sekolah Dasar (SD)
- c. Sekolah Dasar atau sederajat
- d. Sekolah Lanjutan Tingkat Pertama (SLTP)
- e. Sekolah Lanjutan Tingkat Atas (SLTA)
- f. Universitas
- g. Lain-lain (Sebutkan): \_\_\_\_\_

11. a. Apakah di desa ini Saudara memiliki jabatan?  
Ya  Tidak  V045
- [JIKA TIDAK, BERLANJUT KE NOMOR 12]
- b. Jika ya, sebutkan: \_\_\_\_\_ V046

12. a. Apakah pekerjaan tetap Saudara? Sebutkan:  
\_\_\_\_\_ V047
- b. Berapa waktu yang digunakan rata<sup>2</sup> per bulan?
- Musim kemarau:   Hari per Bulan V048
- Musim hujan/rendengan:   Hari per Bulan V049

13. a. Di samping pekerjaan tetap tersebut, apakah Saudara mempunyai pekerjaan sampingan? V050
- Ya  Tidak
- [JIKA TIDAK, BERLANJUT KE NOMOR 14]
- b. Jika ya, sebutkan:  
\_\_\_\_\_ V051

- c. Berapa waktu yang digunakan rata<sup>2</sup> per bulan?
- Musim kemarau:   Hari per Bulan V052
- Musim hujan/rendengan:   Hari per Bulan V053

14. Mohon dijelaskan kondisi rumah Saudara:
- a. Listrik di desa? Ya  Tidak  V054
- b. Listrik di rumah? Ya  Tidak  V055
- c. Lantai: - Tanah  V056
- Kayu
- Semen atau tegel
- d. Atap: - Kayu/Bilik  V057
- Seng
- Asbes
- Genteng

- e. Dinding: - Bilik/Bamboo  V058
- Kayu
- Batu Bata
- f. Lain-lain (Sebutkan): \_\_\_\_\_  V059

15. Apakah rumah tangga Saudara memiliki barang-barang berikut? Berapa?

- a. Radio  f. Bajak sapi
- b. Tape  g. Gerobak sapi
- c. Televisi  h. Traktor
- d. Sepeda  i. Mesin Diesel
- e. Sepeda motor  j. Perahu
- k. Mobil

## B. Taman Nasional Way Kambas

16. Menurut Saudara, apa nama lengkap hutan suaka yang berbatasan dengan desa Saudara?  
\_\_\_\_\_ V071
- Tidak tahu  V071

17. Menurut Saudara, apakah yang dimaksud dengan "Taman Nasional Way Kambas?" V072
- Pusat Latihan Gajah (PLG) saja  V072
- Seluruh wilayah hutan Way Kambas saja  V073
- PLG dan seluruh hutan Way Kambas  V074
- Lainnya (sebutkan)  V075
- \_\_\_\_\_ V076
- Tidak Tahu  V077

Untuk pertanyaan-pertanyaan berikut, untuk menyebut PLG DAN hutan Way Kambas, kita gunakan istilah "Hutan Suaka Way Kambas" [TAMAN NASIONAL WAY KAMBAS]

18. Menurut Saudara, kira-kira tahun berapa HSWK dibangun?  
19   V078
- Tidak Tahu  V079

19. Kira<sup>2</sup> sampai seberapa jauh batas luas hutan suaka Way Kambas?
- a. Timur: \_\_\_\_\_ V080
- b. Barat: \_\_\_\_\_ V081
- c. Utara: \_\_\_\_\_ V082
- d. Selatan: \_\_\_\_\_ V083
- Tidak tahu  V084

20. Menurut perkiraan Saudara, sebagian besar areal HSWK merupakan hutan yang: V085
- Pernah ditebang  V085
- Belum pernah ditebang  V086
- Tidak tahu  V087

### C. Penggunaan Lahan

21. a. Dalam satu tahun terakhir ini, apakah Saudara punya ladang atau sawah sendiri? Ya <sub>1</sub> Tidak <sub>2</sub> v079  
 b. Dalam satu tahun terakhir ini, apakah Saudara menyewa lahan garapan? Ya <sub>1</sub> Tidak <sub>2</sub> v080  
 c. Berapa jumlah seluruh luas pekarangan dan lahan garapan Saudara?   ,   ha v081  
 d. Apakah seluruh lahan yang Saudara garap terdiri dari satu bagian? Ya <sub>1</sub> Tidak <sub>2</sub> v082  
 (JIKA TIDAK, MOHON DIRINCI)

Luas Bagian (ha)	Jenis Lahan Sawah, Pekarangan, Ladang dll	Asal Beli, Buka hutan, Warisan, Numpang, Sewa, Milik Desa, dari pemerintah dll	Jarak Dari Batas TNWK (km)	Tanaman Pangan	Ya	Tidak
v083 A.	v084	v085	v086	Padi Gogo	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v087
				Padi Sawah	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v088
				Jagung	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v089
				<del>Singkong</del>	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v090
					<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v091
v093 B.	v094	v095	v096	Padi Gogo	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v097
				Padi Sawah	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v098
				Jagung	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v099
				<del>Singkong</del>	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v100
					<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v101
v103 C.	v104	v105	v106	Padi Gogo	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v107
				Padi Sawah	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v108
				Jagung	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v109
				<del>Singkong</del>	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v110
					<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v111
v113 D.	v114 Peka- rangan	v115	v116	Kelapa	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v117
				<del>Pisang</del>	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v118
					<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v119
					<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v120
					<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v121
	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> v122				

22. a. Apakah dalam satu tahun terakhir ini tanaman Saudara mengalami gangguan penyakit?  
 [JIKA TIDAK, BERLANJUT KE PERTANYAAN NOMOR 23] Ya <sub>1</sub> Tidak <sub>2</sub> v123

b. Jika ya, penyakit apa dan berapa luas kerusakan?  
 Jenis Penyakit

i. \_\_\_\_\_ v124

ii. \_\_\_\_\_ v126

Jumlah Kerusakan

m<sup>2</sup> v125 Tidak Tahu <sub>888</sub>

m<sup>2</sup> v127 Tidak Tahu <sub>888</sub>

23. Dalam setahun terakhir ini, mohon dirinci jadwal musim tanam dan musim panen untuk setiap tanaman yang Saudara usahakan.

	Musim Tanam I			Musim Tanam II			Musim Tanam III			
	BT	BP	Hasil (ton)	BT	BP	Hasil (ton)	BT	BP	Hasil (ton)	
a. Padi Gogo	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	V128-136
b. Padi Sawah	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	V137-145
c. Jagung	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	V146-154
d. Singkong	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	V155-063
e. _____	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	V164-173
f. _____	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	V174-183
g. _____	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> , <input type="text"/>	V184-193

**D. Hubungan Antara Manusia dengan Satwa**

24. Dalam waktu setahun terakhir, apakah lahan Saudara sendiri pernah digangguan gajah yang ada di HSWK?  
 [JIKA TIDAK, BERLANJUT KE PERTANYAAN NOMOR 27] Ya  $O_1$  Tidak  $O_2$  V194

25. Jika ya, seberapa sering Saudara merasakan gangguan gajah yang ada di HSWK? V195  
 Hampir tiap hari  $O_4$  Jarang  $O_1$   
 Sering  $O_3$  Lain-lain (Jelaskan)  $O_{xx}$   
 Kadang-kadang  $O_2$  \_\_\_\_\_

26. Untuk musim sekarang, musim hujan kemarin, dan musim kemarau kemarin, mohon dirinci jenis tanaman Saudara yang dirusak gajah, dan memperkirakan jumlah kejadian dan kerusakan tersebut. V196-260

Tanaman yang Diganggu	Jarak dari Batas WK (m)	Musim Sekarang		Musim Hujan Kemarin		Musim Kemarau Kemarin	
		Perkiraan Kerusakan (Rtg atau m <sup>2</sup> )	Perkiraan Kejadian (Kali terjadi)	Perkiraan Kerusakan (Rtg atau m <sup>2</sup> )	Perkiraan Kejadian (Kali terjadi)	Perkiraan Kerusakan (Rtg atau m <sup>2</sup> )	Perkiraan Kejadian (Kali terjadi)
Padi Gogo V196-202							
Padi Sawah V203-09							
Jagung V210-216							
Singkong V217-223							
Kelapa V224-230							
Pisang V231-237							
V238-245							
V246-253							

27.a. Menurut Saudara di desa ini, dari tahun ke tahun, bagaimanakah tingkat gangguan gajah dari HSWK? V254  
 b. Menurut Saudara, apa sebabnya? V255  
 Sangat meningkat  $O_5$  Menurun  $O_2$   
 Meningkat  $O_4$  Sangat menurun  $O_1$   
 Sama saja  $O_3$  Tidak Tahu  $O_8$

28.a. Apakah dalam setahun terakhir ini Saudara pernah ikut menjaga di desa ini dari gangguan gajah?  
*[JIKA TIDAK, BERLANJUT KE PERTANYAAN NOMOR 29]* Ya  $O_1$  Tidak  $O_2$   $V_{256}$

b. Jika ya, kira-kira berapa hari atau malam Saudara menjaga lahan dari gangguan gajah pada musim hujan kemarin dan musim kemarau kemarin:  
 Musim hujan kemarin:    Hari  $V_{257}$   
 Musim kemarau kemarin:    Hari  $V_{258}$   
 Tidak Tahu  $O_{888}$

29. Menurut Saudara, cara-cara apakah yang harus dilakukan untuk mencegah agar gajah-gajah tidak keluar dari HSWK?  
 Tidak Tahu  $O_8$

- a.  $V_{259}$
- b.  $V_{260}$
- c.  $V_{261}$

30. a. Dalam waktu setahun terakhir, apakah Saudara pernah merasa gangguan binatang selain gajah dari hutan suaka Way Kambas?  
 Ya  $O_1$  Tidak  $O_2$   $V_{262}$

*[JIKA TIDAK, BERLANJUT KE PERTANYAAN NOMOR 31]*

b. Jika ya, sebutkan:

	Hampir tiap Hari	Sering	Kadang	Jarang	Tidak Pernah	
1.	$O_1$	$O_2$	$O_3$	$O_4$	$O_5$	$V_{263}$
2.	$O_1$	$O_2$	$O_3$	$O_4$	$O_5$	$V_{264}$

31. a. Apakah Saudara sendiri atau keluarga Saudara pernah terluka karena binatang HSWK?  $V_{265}$  Pernah  $O_1$   
*[JIKA TIDAK, BERLANJUT KE PERTANYAAN NOMOR 32]* Tidak  $O_2$

b. Jika ya, mohon disebutkan waktu (tahun/bulan), jenis binatang, serta gangguan dan luka yang dialami:  $V_{266}$   
 Waktu  $V_{266}$  Jenis Binatang  $V_{267}$  Gangguan/Luka  $V_{268}$

32. a. Apakah Saudara atau anggota keluarga Saudara pernah mendengar, melihat, melihat kotoran/jejak, atau diganggu harimau? *[JIKA TIDAK, BERLANJUT KE PERTANYAAN NOMOR 33]*  $V_{269}$  Pernah  $O_1$   
 Tidak  $O_2$

b. Jika ya, mohon disebutkan waktu, tempat, serta jenis kejadian gangguan harimau baik di dalam maupun di luar HSWK.

Waktu	Tempat	Jenis Kejadian	
i.			$V_{270-272}$
ii.			$V_{273-275}$
iii.			$V_{276-278}$

### E. Pemahaman/Pengetahuan

Mohon pertanyaan-pertanyaan mengenai satwa, hutan suaka Way Kambas, serta konservasi berikut dijawab sebisannya. Beberapa pertanyaan ada yang sulit. Jika tidak tahu, katakan saja "tidak tahu".

33. Menurut Saudara [TUNJUKAN GAMBAR ELE] :

- Apakah nama binatang yang ada di gambar ini?
- Apakah binatang ini ada di HSWK?
- Apakah Saudara pernah melihat binatang tersebut?

Nama Binatang	Ada di HSWK?			Pernah Melihat?			
	Ya Tidak ?			Ya Tidak ?			
	1	2	8	1	2	8	
a. _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	V279-V281

34. Menurut Saudara, apakah makanan utama gajah?

- Tidak Tahu  8
- a. \_\_\_\_\_ V282
- b. \_\_\_\_\_ V283
- c. \_\_\_\_\_ V284

35. Menurut perkiraan Saudara, kira-kira berapa jumlah gajah liar di hutan suaka Way Kambas?

-      V285-V286

Lain-Lain: \_\_\_\_\_ V287

Tidak Tahu  88888

36. Menurut perkiraan Saudara, seberapa besar gajah liar di hutan suaka Way Kambas didatangkan dari mana?

- a. \_\_\_\_\_ V288
- b. \_\_\_\_\_ V289
- c. \_\_\_\_\_ V290

37. Apakah Saudara pernah berkunjung ke Pusat Latihan Gajah (PLG) di HSWK? V291

Ya  1, Tidak  2

Jika ya, berapa kali?   V292

38. Menurut perkiraan Saudara, berapa jumlah gajah yang ada di Pusat Latihan Gajah (PLG)?     V293

Tidak Tahu  8888

39. Menurut Saudara [TUNJUKAN GAMBAR BINATANG] :

- Apakah nama<sup>2</sup> binatang<sup>2</sup> yang ada di gambar ini?
- Apakah binatang<sup>2</sup> ini ada di HSWK?
- Apakah Saudara pernah melihat binatang<sup>2</sup> tersebut?

Nama <sup>2</sup> Binatang	Ada di HSWK?			Pernah Melihat?			
	Ya Tidak ?			Ya Tidak ?			
	1	2	8	1	2	8	
a. _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	V294-V297
b. _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	V298-V301
c. _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	V302-V305
d. _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	V306-V309
e. _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	V310-V313
f. _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	V314-V317
g. _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	V318-V321
h. _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	V322-V325

40. Menurut Saudara [TUNJUKAN GAMBAR TIGER] :

- Apakah nama binatang yang ada di gambar ini?
- Apakah binatang ini ada di HSWK?
- Apakah Saudara pernah melihat binatang tersebut?

Nama Binatang	Ada di HSWK?			Pernah Melihat?			
	Ya Tidak ?			Ya Tidak ?			
	1	2	8	1	2	8	
a. _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	V326-V330

41. Menurut Saudara, bagaimanakah jumlah harimau di Pulau Sumatera saat ini (dari Aceh sampai ke Lampung) dibandingkan dengan jumlah 20 tahun yang lalu? V331

- Lebih Banyak  3
- Sama Saja  2
- Lebih Sedikit  1
- Tidak Tahu  8

42. Menurut Saudara, bagaimanakah jumlah harimau di hutan suaka Way Kambas saat ini dibandingkan dengan jumlah 20 tahun yang lalu? V332

- Lebih Banyak  3
- Sama Saja  2
- Lebih Sedikit  1
- Tidak Tahu  8

43. Menurut perkiraan Saudara, kira-kira berapa jumlah harimau liar di hutan suaka Way Kambas?

-      V333-V334

Lain-Lain: \_\_\_\_\_

Tidak Tahu  88888



44. Menurut Saudara, berapa banyak harimau liar yang ada di hutan-hutan di pulau Jawa? <sup>V335</sup>

Sangat Banyak <sub>1</sub> Sangat Sedikit <sub>4</sub>  
 Banyak <sub>2</sub> Tidak Ada <sub>5</sub>  
 Sedikit <sub>3</sub> Tidak Tahu <sub>6</sub>

47. Menurut Saudara, sebagian besar pengunjung Pusat Latihan Gajah (PLG) berasal dari: <sup>V346</sup>

Lampung <sub>1</sub>  
 Sumatera (di luar Lampung) <sub>2</sub>  
 Jawa dan Jakarta <sub>3</sub>  
 Orang Asing (luar negeri) <sub>4</sub>  
 Tidak Tahu <sub>6</sub>

45. Menurut Saudara, apakah makanan utama harimau?

Tidak Tahu <sub>85</sub>

a. \_\_\_\_\_ <sup>V336</sup>  
 b. \_\_\_\_\_ <sup>V337</sup>  
 c. \_\_\_\_\_ <sup>V335</sup>

48. Menurut Saudara, sebaiknya daerah rawa dijadikan: <sup>V347</sup>

Lahan pertanian <sub>1</sub>  
 Lahan pelestarian alam <sub>2</sub>  
 Lain-lain (Sebutkan): \_\_\_\_\_ <sub>xx</sub>  
 Tidak Tahu <sub>85</sub>

46. a. Apakah Saudara merasa bahwa beberapa bagian tubuh harimau dapat dijadikan obat-obatan tradisional atau jimat? <sup>V339</sup> Ya <sub>1</sub> Tidak <sub>2</sub> Tidak Tahu <sub>6</sub>

49. Menurut Saudara, jumlah binatang yang telah mengalami kepunahan (tidak ada lagi) pada 10 tahun terakhir di dunia ini: <sup>V348</sup>

Sangat Banyak <sub>1</sub> Sangat Sedikit <sub>4</sub>  
 Banyak <sub>2</sub> Tidak Tahu <sub>6</sub>  
 Sedikit <sub>3</sub>

b. Jika ya, sebutkan bagian dan kegunaannya: <sup>V340-345</sup>

Bagian Badan	Kegunaannya	?
1. _____	_____	<input type="radio"/> <sub>6</sub>
2. _____	_____	<input type="radio"/> <sub>6</sub>
3. _____	_____	<input type="radio"/> <sub>6</sub>

**F. Pemanfaatan Sumberdaya Lahan**

50. a. Apakah Saudara memiliki ternak? Ya <sub>1</sub> Tidak <sub>2</sub> <sup>V349</sup>  
 b. Apakah Saudara mengadu ternak? Ya <sub>1</sub> Tidak <sub>2</sub> <sup>V350</sup>

[JIKA TIDAK UNTUK 50a DAN 50b, BERLANJUT KE NOMOR 55]

c. Jika ya, mohon didaftar jumlah dan jenis ternak yang Saudara milik maupun Saudara gadu.

	Jumlah Dimiliki	Jumlah Digadu	Jumlah Dimiliki	Jumlah Digadu
Ayam	<input type="checkbox"/> <input type="checkbox"/> <sup>V351</sup>	<input type="checkbox"/> <input type="checkbox"/> <sup>V352</sup>	Babi	<input type="checkbox"/> <input type="checkbox"/> <sup>V359</sup>
Bebek / Mentok	<input type="checkbox"/> <input type="checkbox"/> <sup>V353</sup>	<input type="checkbox"/> <input type="checkbox"/> <sup>V354</sup>	Sapi	<input type="checkbox"/> <input type="checkbox"/> <sup>V361</sup>
Kambing	<input type="checkbox"/> <input type="checkbox"/> <sup>V3553</sup>	<input type="checkbox"/> <input type="checkbox"/> <sup>V356</sup>	Kerbau	<input type="checkbox"/> <input type="checkbox"/> <sup>V363</sup>
Angsa (Banyak)	<input type="checkbox"/> <input type="checkbox"/> <sup>V357</sup>	<input type="checkbox"/> <input type="checkbox"/> <sup>V355</sup>	Lain-Lain (sebutkan): _____	<input type="checkbox"/> <input type="checkbox"/> <sup>V365</sup>

[JIKA TIDAK ADA SAPI, KERBAU, ATAU KAMBING, BERLANJUT KE NOMOR 55]

51. a. Apakah dalam satu tahun terakhir Saudara mengembalakan ternak? Ya <sub>1</sub> Tidak <sub>2</sub> <sup>V366</sup>

[JIKA TIDAK, BERLANJUT KE NOMOR 53]

b. Jika ya, mohon dijelaskan jika Saudara sering menggunakan, kadang-kadang menggunakan, jarang menggunakan, atau tidak pernah menggunakan rawa desa atau rawa suka pada musim kemarau dan musim hujan/rendengan untuk mengembalakan ternak Saudara.

Sumber	Musim Kemarau					Musim Hujan/Rendengan				
	Sering	Kadang <sup>2</sup>	Jarang	Tidak Pernah		Sering	Kadang <sup>2</sup>	Jarang	Tidak Pernah	
i. Rawa Desa	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<sup>V367</sup>	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<sup>V370</sup>
ii. Rawa Suaka	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<sup>V368</sup>	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<sup>V371</sup>
iii. Lain-Lain (Jelaskan):	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<sup>V369</sup>	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<sup>V372</sup>

[JIKA TIDAK PERNAH DI RAWA SUKA, BERLANJUT KE NOMOR 53]

52. Jika Saudara mengembalakan ternak di rawa suaka, rata-rata berapa kali dalam sebulan pada:

a. Musim Kemarau:   Hari per Bulan <sup>V373</sup>  
 b. Musim Hujan/Rendengan:   Hari per Bulan <sup>V374</sup>



59. Bila tidak ada larangan pemerintah dan kita bebas masuk ke suaka hutan Way Kambas, menurut Saudara, bagaimana jika kegiatan-kegiatan ini dilakukan?

	Sebaiknya Boleh	Sebaiknya Tidak Boleh		Sebaiknya Boleh	Sebaiknya Tidak Boleh
a. Mencari rumput	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> V435	d. Mencari ikan	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> V438
b. Mencari kayu bakar	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> V436	e. Mencari burung, napb dll	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> V439
c. Menggembala ternak	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> V437	f. Menebang kayu	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub> V440

## H. Sikap dan Pendirian

Mohon tunjukkan pendapat atau tanggapan Saudara pada pernyataan-pernyataan berikut dengan menggunakan skala Sangat Setuju sampai Sangat Tidak Setuju [TUNJUKAN KARTU]. Saudara tak perlu menjelaskan alasan mengapa memilih jawaban tersebut: (1) Sangat Setuju; (2) Setuju; (3) Ragu-ragu; (4) Tidak Setuju; (5) Sangat Tidak Setuju.

	Sangat Setuju 1	Setuju 2	Ragu- Ragu 3	Tidak Setuju 4	Sangat Tidak Setuju 5
<b>Contoh</b>					
60. Sebagian besar transmigran di daerah ini berasal dari pulau Jawa.	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<input type="radio"/> <sub>5</sub> V441
61. Bulan January (Bulan 1) merupakan bulan kering di daerah ini.	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<input type="radio"/> <sub>5</sub> V442
<b>Keanekaragaman Hayati</b>					
62. Gajah sebaiknya ditangkap oleh PHPA (PPA) jika sudah keluar dari HSWK.	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<input type="radio"/> <sub>5</sub> V443
63. Gajah dapat dikatakan merusak tanaman.	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<input type="radio"/> <sub>5</sub> V444
64. a. Di desa Rawa Jitu ada <u>gajah</u> yang dibunuh seseorang karena merusak tanaman penduduk, bagaimana menurut Saudara?	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<input type="radio"/> <sub>5</sub> V445
b. Sebaiknya apa yang perlu diberikan terhadap orang itu? V446					
			Penghargaan besar Penghargaan kecil Dibiarkan	<input type="radio"/> <sub>1</sub> <input type="radio"/> <sub>2</sub> <input type="radio"/> <sub>3</sub>	Sanksi ringan <input type="radio"/> <sub>4</sub> Sanksi berat <input type="radio"/> <sub>5</sub> Tidak Tahu <input type="radio"/> <sub>6</sub>
65. Harimau dapat dikatakan pengganggu penduduk.	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<input type="radio"/> <sub>5</sub> V447
66. Harimau yang membunuh ternak penduduk sebaiknya dibunuh.	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<input type="radio"/> <sub>5</sub> V448
67. Harimau dan manusia sebenarnya dapat hidup tidak saling mengganggu.	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<input type="radio"/> <sub>5</sub> V449
68. a. Di desa Rawa Jitu ada <u>harimau</u> yang dibunuh seseorang karena makan ternak penduduk. Bagaimana menurut Saudara?	<input type="radio"/> <sub>1</sub>	<input type="radio"/> <sub>2</sub>	<input type="radio"/> <sub>3</sub>	<input type="radio"/> <sub>4</sub>	<input type="radio"/> <sub>5</sub> V450
b. Sebaiknya apa yang perlu diberikan terhadap orang itu? V451					
			Penghargaan besar Penghargaan kecil Dibiarkan	<input type="radio"/> <sub>1</sub> <input type="radio"/> <sub>2</sub> <input type="radio"/> <sub>3</sub>	Sanksi ringan <input type="radio"/> <sub>4</sub> Sanksi berat <input type="radio"/> <sub>5</sub> Tidak Tahu <input type="radio"/> <sub>6</sub>

69. a. Bila ada bagian-bagian tertentu dari tubuh harimau yang diperjualbelikan di pasar dengan harga yang murah, apakah Saudara mau membelinya?

Ya  Tidak  *V452*

b. Jika ya, sebutkan bagian dan kegunaan:

**Bagian Badan**

**Kegunaannya**

**Tidak Tahu**

i.

*V453-4*

ii.

*V455-6*

iii.

*V457-8*

**Sangat**

*Sangat Setuju*  
1

*Setuju*  
2

*Ragu-Ragu*  
3

*Tidak Setuju*  
4

*Tidak Setuju*  
5

70. Beberapa pohon-pohon dan binatang-binatang memang perlu hidup di tempat yang jauh dari tempat tinggal penduduk.

*V459*

71. Penduduk dapat memelihara burung dalam sangkar (kurungan).

*V460*

72. Hutan adalah tempat yang berbahaya untuk penduduk.

*V461*

73. Hutan adalah tempat yang angker untuk penduduk.

*V462*

74. Jika berburu boleh dilakukan di dalam HSWK, sebagian binatang disana akan cepat habis.

*V463*

75. Menurut Saudara, di Sumatera hutan yang dapat dijadikan lahan pertanian: *V464*

*Sangat banyak*  
*Banyak*  
*Sedang*

*O1*  
 *O2*  
 *O3*

*Sedikit*  *O4*  
*Sangat sedikit*  *O5*  
*Tidak Tahu*  *O8*

**TNWK dan PHPA**

76. Peraturan yang ada sebaiknya diubah, sehingga penduduk dapat lebih bebas masuk ke dalam HSWK

*V465*

77. Untuk melindungi binatang-binatang, patroli PHPA (PPA) tidak diperlukan.

*V466*

78. Para pegawai PHPA (PPA) memperhatikan keperluan masyarakat.

*V467*

79. Para petugas PHPA (PPA) tidak mengetahui permasalahan yang dialami penduduk di desa ini.

*V468*

80. Jika Saudara sendiri tidak diperbolehkan masuk HSWK, sebaiknya turis juga dilarang memasuki.

*V469*

81. Bagaimana seandainya HSWK dibuka untuk lahan pertanian?

*V470*

82. Hutan suaka Way Kambas tidak ada manfaatnya untuk penduduk.

*V471*

83. a. Apakah Saudara merasa ikut bertanggung jawab dalam pengelolaan HSWK?

Ya  Tidak  *V472*

b. Mengapa? *V473*

84. Menurut Saudara, batas HSWK dengan lahan penduduk: <sup>V474</sup> Sangat jelas <sub>1</sub> Tidak jelas <sub>4</sub>  
 Jelas <sub>2</sub> Tidak ada <sub>5</sub>  
 Kurang jelas <sub>3</sub> Tidak tahu <sub>6</sub>

85. a. Apa Saudara senang dengan adanya hutan Way Kambas? Ya <sub>1</sub> Tidak <sub>2</sub> <sup>V475</sup>  
 b. Mengapa? <sup>V476</sup>

86. Apa yang paling tidak Saudara sukai tentang HSWK? <sup>V477</sup>

87. a. Apakah HSWK ada manfaatnya bagi masyarakat? Ya <sub>1</sub> Tidak <sub>2</sub> <sup>V478</sup>

b. Apa manfaatnya? <sup>V479</sup>

88. a. Menurut Saudara, bagaimana sikap masyarakat setempat terhadap PHPA (PPA)? <sup>V480</sup>

b. Apakah Saudara bisa menjelaskan jawaban Saudara? <sup>V481</sup> Sangat Baik <sub>1</sub> Jelek <sub>4</sub>  
 Baik <sub>2</sub> Sangat Jelek <sub>5</sub>  
 Sedang <sub>3</sub> Tidak tahu <sub>6</sub>

89. a. Menurut Saudara, bagaimana sikap PHPA (PPA) sendiri terhadap masyarakat? <sup>V482</sup>

b. Apakah Saudara bisa menjelaskan jawaban Saudara? <sup>V483</sup> Sangat Baik <sub>1</sub> Jelek <sub>4</sub>  
 Baik <sub>2</sub> Sangat Jelek <sub>5</sub>  
 Sedang <sub>3</sub> Tidak tahu <sub>6</sub>

90. Dalam 5 tahun terakhir, apakah Saudara pernah ikut pertemuan dengan pegawai PHPA (PPA)? Ya <sub>1</sub> Tidak <sub>2</sub> <sup>V484</sup>

Ya,  kali <sup>V485</sup>

91. Menurut Saudara, apa kegiatan/pekerjaan para pegawai PHPA (PPA) itu?

1. Tidak tahu <sub>6</sub> <sup>V486</sup>

2. <sup>V487</sup>

3. <sup>V485</sup>

92. a. Apakah Saudara pernah mendapat sanksi dari PHPA (PPA)? Ya <sub>1</sub> Tidak <sub>2</sub> <sup>V489</sup>

b. Jika ya, bentuk sanksinya apa? \_\_\_\_\_ <sup>V490</sup>

***Pertanyaan/survey selesai sampai disini. Apakah ada pertanyaan khusus Saudara untuk kami?***

***Terima kasih sekali lagi atas waktu yang diberikan serta bantuan Saudara menjawab pertanyaan di atas!***



**Keterangan (pertanyaan, komentar, saran) dari responden:**

**Keterangan (pertanyaan, komentar, saran) dari pewawancara:**



Apakah dalam menjawab pertanyaan, responden dibantu/dipengaruhi orang lain?

Ya  $O_1$       Tidak  $O_2$  v492

Jika ya, kira-kira berapa pertanyaan: v492

a. <10%	$O_1$	d. 50-74%	$O_4$
b. 10-24%	$O_2$	e. >75%	$O_5$
c. 25-49%	$O_3$	d. Tidak Tahu	$O_6$

Waktu wawancara selesai: \_\_\_\_\_



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# PRESS RELEASE

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Proyek Penyelamatan Harimau Sumatera - Sumatran Tiger Project

Kotak Pos 190, Metro, Lampung Tengah 34101 Indonesia

## For Immediate release

**Date:** May 30, 1996  
**Contact:** Ir. Soemarsono  
Director General of Forest Protection and Nature Conservation, PHPA  
**Telephone:** +62 (021) 572 0227

## First Photograph of Rare Flat-Headed Cat Reported From Way Kambas National Park, Sumatra

PHPA Director General of Forest Protection and Nature Conservation, Ir. Soemarsono, announced that a joint PHPA-Sumatran Tiger Project field team working on tiger conservation in Way Kambas National Park photographed the rare Flat-headed cat (*Felis planiceps*), a small, short-tailed cat with small ears and a flat forehead. The photograph was taken on 10 April 1996 in old secondary lowland forest habitat using a specialized camera system that is triggered when an animal passes through an invisible infrared beam.

The Flat-headed cat is one of the rarest and least known of the jungle-dwelling cats in Southeast Asia. It is considered critically endangered by the Cat Specialist Group of the World Conservation Union (IUCN) throughout its range from Southern Thailand through Malaya to Sumatra and Borneo, Indonesia. It weighs only two kilograms, or the same as a domestic cat, its fur is dark-brown to dark-gray with no stripes or spots, only a few stripes are found on its cheeks and it is easily distinguished from all other small jungle cats by its short tail which is only one-quarter the length of the body. The specialized morphology of the head and feet suggests it feeds mainly on aquatic animals.

The picture represents the first known photograph of a wild Flat-headed cat, confirming the species presence in Way Kambas, and its continued existence in Sumatra, the southern-most location of the species range in Southeast Asia.

The Director of Nature, Flora and Fauna Conservation of the PHPA, Ir. Dwiatmo Siswomartono, recently visited the base-camp of the team in Way Kambas and was presented with the photograph. The Sumatran Tiger Project is a collaborative research project between PHPA, Taman Safari Indonesia and the IUCN/SSC Conservation Breeding Specialist Group (CBSG) which is collecting a scientific database on the ecology and population structure of wild tigers and their interactions with village people living on the edge of the park. The project is sponsored by the Indonesian Institute of Sciences (LIPI) and is funded by the *Save the Tiger Fund*, a special program of the National Fish and Wildlife Foundation (USA) and the Exxon Corporation, Esso U.K., and Esso Indonesia.

**End of Press Release**



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# PRESS RELEASE

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Proyek Penyelamatan Harimau Sumatera - Sumatran Tiger Project  
Kotak Pos 190, Metro, Lampung Tengah 34101 Indonesia

**For Immediate release**

**Date:** May 12th, 1996

**Contact:** Ir. Dwiatmo Siswomartono

Director of Nature, Flora and Fauna Conservation, PHPA

**Telephone:** +62 (021) 572 0227

## More Evidence of Rare Wildlife in Way Kambas National Park, Sumatra

Director of Nature, Flora and Fauna Conservation of the PHPA, Ir. Dwiatmo Siswomartono, recently visited Way Kambas National Park, Sumatra to review progress of the Sumatran Rhino Sanctuary (SRS), a joint effort between Taman Safari Indonesia, the International Rhino Foundation and PHPA to design and construct a safe refuge for Sumatran rhinos now held in Indonesian zoos. The objective of the project is to provide the rhinos with a natural habitat in the hope that they will reproduce. So far, no Sumatran rhinos have successfully bred in captivity, either in Indonesia, Malaysia, the U.K. or in the United States. Construction will begin soon. Afterwards the Director visited the joint PHPA-Sumatran Tiger base-camp located nearby at Way Kanan. Project staff presented the Director with new photographs of the tiger population living in the park, and explained their field operations that started ten months ago. The team has provided the first photographic proof of the existence of the extremely rare Sumatran rhino in the park, both from the automatic cameras and from direct observation and photographs by field teams. In the week before the PHPA visit to the site a new Sumatran rhino photograph was obtained. This was presented to the Director of Flora and Fauna Conservation, and named *Dwiatmo* in his honour.

The PHPA-Sumatran Tiger Project team, using automatic infrared activated cameras, has now catalogued many tiger photographs in Way Kambas National Park, providing vital information for the conservation management of this rare species in Indonesia. In the core study site ten tigers have been individually identified by their unique stripe patterns. It is the intention of the field team to investigate the ecology of this endangered species, its problems and threats, its habitat requirements, and its relationship with local human populations living along the edge of the park. The detailed information collected over the four years will be used, in accordance with the Ministry of Forestry's *Sumatran Tiger Conservation Strategy*, to protect and ensure that the Sumatran tiger continues to exist within Indonesia forever.

In addition to the tiger pictures, the project team has had many other successes, including photographs of such rare and endangered species as the golden cat, the marbled cat, the otter-civet, the Malaysian tapir, the banded palm civet, the otter civet, as well as many other more common Sumatran mammals.

The Sumatran Tiger Project is a collaborative research programme between PHPA, Taman Safari Indonesia, and the IUCN/SSC Conservation Breeding Specialist Group (CBSG) designed to produce a scientific database on the ecology and population of wild tigers and their interactions with people living in villages surrounding the park. The project is sponsored by the Indonesian Institute of Sciences (LIPI). The four year project is funded by Esso UK, Esso Indonesia and the *Save the Tiger Fund*, a special project of the National Fish and Wildlife Foundation (USA) and Exxon Corporation.

**End of press release.**



# THE SUMATRAN RHINO IN WAY KAMBAS NATIONAL PARK, SUMATRA, INDONESIA

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<sup>5</sup> Way Kambas Sumatran Tiger Project, Secretariat for Sumatran Tiger Project,  
Taman Safari Indonesia, Cisarua, Bogor, Indonesia

<sup>6</sup> IUCN/SSC Asian Rhino Specialist Group & International Rhino Foundation,  
14000 International Road, Cumberland, OH 43732, USA

Photo credit: Ron Tilson and Neil Franklin



*A Sumatran rhino in the wild, photographed with an infrared camera trap in Way Kambas National Park, Sumatra, Indonesia.*

The Sumatran rhinoceros (*Dicerorhinus sumatrensis*) is probably the most critically endangered species of rhino. Perhaps as few as 400 survive. Approximately 200-250 of them occur on Sumatra in perhaps 10 localities, of which three are considered to harbour the major rhino concentrations: Gunung Leuser National Park, Kerinci Seblat National Park and Bukit Barisan Selatan National Park. Remnant populations are suspected to occur in other areas. A population and habitat viability assessment (PHVA) workshop in 1993 revealed that the rhino population in Sumatra was only 50% of previous estimates.

The Directorate General of Forest Protection and Nature Conservation (PHPA) in Indonesia is conducting an intensive programme for in situ protection through development and deployment of anti-poaching teams. The initial, catalytic funds for this programme are being provided by a grant from the Global Environment Fund (GEF) through the United Nations Development Programme (UNDP). This GEF project arose out of the United Nations Environment Programme (UNEP) Conference on Financing Rhinoceros Conservation in 1992 and again in 1993. The Asian Rhino Specialist Group has facilitated the GEF Project.

Until five years ago, the Sumatran rhino was believed to be extinct in Way Kambas National Park. However, reports suggested that rhinos might still occur in the area. In the earliest reports, it was unclear if the species was Sumatran or Javan. However, the size of some of the tracks indicated that it was the Sumatran species. The possibility of the Sumatran rhino still occurring in Way Kambas was discussed at the 1993 PHVA workshop. Its occurrence has now been unequivocally confirmed.

Colour photographs of the Sumatran rhino in the wild are even rarer than the species itself. The photograph accompanying this article was collected by an infrared camera trap, which is used in the Sumatran Tiger Project in Way Kambas National Park. The Tiger Project is a collaborative project with PHPA and Taman Safari Indonesia.

Way Kambas is also the site of a proposed Sumatran Rhino Sanctuary (SRS), which is currently defined in the Asian rhino conservation community as a managed breeding centre in native habitat\*. Despite great expectations and efforts, the captive breeding programme for Sumatran rhinos, which commenced in 1984, has not been successful. A total of 40 rhinos have been captured in three areas where independent projects have been conducted: Indonesia (in co-operation with zoological organisations from the United Kingdom and United States), Peninsula Malaysia and Sabah. A major problem is believed to be the unnatural conditions which are provided by the captive programmes i.e. in terms of diet, climate (especially exposure to excessive sunlight and its ultraviolet component), size and complexity of enclosures, and social configuration of the rhino. As a consequence, the concept of re-orientating the captive programmes into managed breeding centres in a native habitat was developed through a series of meetings in Indonesia with PHPA. These "sanctuaries" will provide much larger enclosures and more natural conditions for the rhinos. The centres will be populated by rhinos which have been repatriated to native habitat from captivity. The SRS Programme is a collaborative effort of PHPA, Taman Safari Indonesia, Yayasan Mistra Rhino and the International Rhino Foundation.

The Way Kambas Tiger Project is financially supported by Esso-UK and the Save the Tiger Fund (a joint venture between Exxon and the US National Fish and Wildlife Foundation). Financial support for the Indonesian Sumatran Rhino in situ protection programme is being provided by the GEF through UNDP with advice from UNEP. Funds for the Sumatran rhino Sanctuary in Way Kambas are being provided by the International Rhino Foundation.

\*The usage of the term "sanctuary" is slightly different in the South East Asian context than in the context of African conservation. However, it is the objective for the managed breeding centres in Asia to evolve towards the African models.



## **IN SITU CONSERVATION OF THE SUMATRAN TIGER IN INDONESIA**

By Ronald Tilson, Neil Franklin, Philip Nyhus, Bastoni, Sriyanto, Dwiatmo Siswomartono, and Jansen Manansang

### **Introduction**

One of the most endangered species of Indonesia, the Sumatran tiger (*Panthera tigris sumatrae*), is recognized as a "key species" in biodiversity conservation (BAPPENAS, 1993) and is considered critically threatened by the IUCN (Nowell and Jackson, 1996). About 400 Sumatran tigers survive in five Indonesian national parks and two game reserves, and another 100 tigers live in unprotected areas scheduled to be converted to agriculture (Santiapillai and Ramono, 1987; Tilson *et al.*, 1994). These small fragmented populations are in need of increased protection and a comprehensive management strategy to ensure their viability. The Sumatran tiger represents the last of three Indonesian subspecies that originally occurred on the islands of Sumatra, Java and Bali. Thus, the Sumatran tiger is not only a significant single component of Indonesian biodiversity but also is symbolic of the biodiversity that remains.

### **The Sumatran Tiger Project**

There are three important issues that affect the long-term survival of tigers in Sumatra. One is to identify the distribution and status of each tiger population and the quality of their habitat. Another is to identify how secure each population is from poaching or disturbance as well as the security of the prey base and habitat. Still another is to develop a Rapid Tiger Status Assessment methodology to accomplish the above tasks and to provide a long-term monitoring system for the evaluation of protection and management policies sanctioned by the government for the long-term viability of wild tigers. It is also important to resolve conflicts between tigers and forest-edge communities living in proximity to tigers, as well as to develop a comprehensive conservation message to all citizens of Indonesia (Ministry of Forestry, 1994).

The first step in providing answers to these issues was taken in 1992 when the Indonesian Department of Forest Protection and Nature Conservation (PHPA) conducted a Population and Habitat Viability Analysis (PHVA) of the wild Sumatran tiger population with the assistance of the IUCN/SSC Conservation Breeding Specialist Group (CBSG) and the American Zoo and Aquarium Association (AZA) (Tilson *et al.*, 1994). Using field reports from PHPA staff and a preliminary Geographic Information System (GIS) database to outline spatial fragmentation and population modelling to estimate the status of tiger populations in Sumatra, PHPA was able to gain a basic understanding of the tiger's status, distribution and threats throughout Sumatra (Faust and Tilson, 1994; Seal *et al.*, 1994; Soemarna *et al.*, 1994).

In recognition of the situation, the *Indonesian Sumatran Tiger Conservation Strategy* was developed by the national conservation authority of the Republic of Indonesia, the Directorate

General of Forest Protection and Nature Conservation (PHPA) in the Ministry of Forestry (Ministry of Forestry, 1994). This document identified an initial set of priorities for conserving tigers, including frameworks for both *in situ* and *ex situ* conservation programs. To our knowledge, no other Southeast Asian tiger range country has produced such a document.

Based upon recommendations set forth in the *Indonesian Sumatran Tiger Conservation Strategy*, a long-term field study of Sumatran tigers was designed. Its objectives are to develop a cost-effective tiger monitoring system (using ground-based census counts, remote camera census, and radiotelemetry), to collect data on tiger life history characteristics vital for managing wild populations, to resolve human-tiger conflicts by partitioning forest resources in an equitable and sustainable manner, to start up community-based tiger education programs, and to train university and PHPA counterparts to become future conservation leaders in Indonesia (Tilson, 1995a; Tilson and Franklin, 1995; Bastoni, 1996; Franklin, 1996; Sriyanto, 1996).

The field component of the Sumatran Tiger Project was initiated in June 1995 in Way Kambas National Park (WKNP), a 130,000 ha lowland rain forest habitat comprised of primary forest, early and late stage secondary forests, grasslands, swamp and mangrove forest situated in southeastern Sumatra, Lampung Province. The Indonesian Institute of Sciences (LIPI) is the sponsoring agency, and the Indonesian Ministry of Forestry and Taman Safari Indonesia (CBSG-Indonesia Program), by signing an Memorandum of Understanding (MOU), are the official collaborating agencies. A base camp was established at Way Kanan in the middle of the park, field research staff were recruited, and a number of field projects are now underway. The community conservation and education component was initiated in December 1995, focusing on villages in the sub-districts (*kecamatan*) of Sukadana and Way Jepara (adjacent to WKNP).

### **Tiger Biology Field Study**

The goal of the field research component is to provide insights into the Sumatran tiger's natural history that will lead to improved conservation management practices for wild tigers by PHPA. Since Sumatran tigers are known to occupy a wide range of habitat types in Sumatra, it is important to investigate the effect of diverse factors such as habitat characteristics, prey base, competition, distance from forest edge, and human disturbance. Techniques will be developed for the censusing and monitoring of wild tigers, including the development, in Way Kambas, of a rapid assessment methodology to be used over the whole of Sumatra.

This will be achieved by a comparative study of the current methodologies available for the censusing and monitoring of wild tigers. Infrared-activated remote cameras, passive trail monitors, and remote video cameras will be of central importance to this investigation, with the results combined with data on tiger ecology to be obtained from radio-telemetry of select tiger individuals (late 1996/early 1997). In addition, correlations will be evaluated between tiger density and the encounter frequency of tiger secondary signs, while the rapid assessment of prey-base, habitat security, and human intrusion will also be investigated. A comparison of the above techniques will have a wider significance than for tiger ecology and monitoring alone, with the development of remote camera census techniques having significant implications for wildlife monitoring in general.

Another objective is to use the developed methodologies to establish vital ecological characteristics of the Sumatran tiger. These will include details regarding the tigers' habitat preference, ranging and space use behavior, activity patterns, social system, and interactions with other species. It will incorporate a consideration of prey-base distribution and availability, prey selection patterns, and an analysis of what is needed to support a population of tigers. Where possible, more detailed reproductive information such as interbirth intervals, cub survivability, and subadult dispersal patterns will be documented.

### **Long-Term Monitoring of Wild Tigers**

Wild tigers are extremely difficult to census because of their secretive nature and near complete avoidance of humans. In the forests of Sumatra, the census of tigers is compounded by the fact that most of the national parks and protected areas are huge, some of these areas are so remote or so inundated with water that they are practicably inaccessible. Further, some tiger populations in Sumatra have been pushed into the higher sub-montane and montane forests, where overall prey densities, and thus tiger populations, are correspondingly low and difficult to census. One promising technique, remote camera censusing, first implemented in Gunung Leuser National Park in northern Sumatra (Griffiths, 1994), is being expanded in scope and evaluated as a tool for censusing and long-term monitoring of tiger populations throughout Sumatra.

As part of the field ecology study, a 162 km<sup>2</sup> site with a perimeter of 57 km for the long-term monitoring of a core population of tigers was identified. Plans are to extend this site to cover about 210 km<sup>2</sup>. This site, representative of all habitats found in Way Kambas, has been incorporated into a GIS database. A systematic census of tigers in this area is being conducted through the use of about 25 remote infrared cameras, regular censusing by staff, and identification of tiger tracks, scrapings, and hair contents of feces (for prey identification). This will allow analysis of tiger activity by habitat type. Passive infrared monitors will also be used to assess prey activity in combination with remote camera photographs.

As of June 1996, over 4,500 photographs have been cataloged, over 70 photographs of tigers have been taken, and twelve tigers have been positively identified as residents or transients living peripherally to this site. One product of this study will be an Indonesian language manual on how to use remote-camera systems for surveying, censusing and monitoring tiger populations (Bastoni, 1996). A related component is how to use the same system to assess tiger prey base compared to line transect counts, which may not be the most efficient or effective method in lowland rain forest habitat (Sriyanto, 1996).

Additional short-term census sites of about 100 km<sup>2</sup> have been identified in the park. Eventually, the entire park will be censused. These sites are being used as training ground to develop effective, yet rapid and economical, techniques to census tigers and tiger prey in different types of habitat, as well as establishing the number of tigers living in WKNP. The results of these efforts will assist in the development of a model that can be expanded for evaluating tiger populations living in key conservation areas in Sumatra by a mobile Tiger Rapid Assessment Team (see below).



### **Tiger Rapid Assessment Team**

Rapid assessment of tiger status and prey, using methodology developed in WKNP, will be employed throughout Sumatra, particularly high priority areas designated by PHPA by a mobile tiger monitoring team. The team will assess habitat characteristics by GIS, ground-truthed by the tiger monitoring team, permitting the evaluation of potential corridors among protected areas and correlations with tiger habitat preferences. The team will also be responsible for surveying local attitudes toward tigers and other wildlife (see below) as well as disseminating conservation education literature about the need to conserve tigers and what to do with "problem" tigers (see *ex situ* tiger programs below). The results of this Sumatra-wide survey will provide vital information to PHPA that, when combined with results from the Sumatran tiger field study, will allow PHPA to update and refine their current document, the *Indonesian Sumatran Tiger Conservation Strategy* (1994).

### **Community Conservation Education**

Another aspect that is critical to the tiger's survival in Sumatra includes an evaluation of human resource use patterns and tiger resource needs, conflict resolution when they overlap, and local attitudes and perceptions regarding conservation issues (Nyhus and Tilson, 1995). The tasks of the community-based conservation education program are to better understand human-wildlife interactions near WKNP and to strengthen local participation in education and conservation efforts in forest-edge communities surrounding the park. To date, no detailed socio-economic studies have been carried out in communities near WKNP or incorporated with tiger biology studies in Sumatra. Conflicts between tigers, other wildlife, and humans, if left unchecked, are likely to increase and endanger the remaining populations of these animals unless steps are taken to enhance public support for conservation efforts.

One of the projects underway in WKNP to establish a quantitative and qualitative database to answer these questions is to analyze demographic data and land use patterns. Primary data are being collected from village registers, government census documents, and existing studies. Data are being mapped so that models can be constructed to determine areas where future conflicts may arise. Information is also being collected from field observations and existing local agricultural and forestry data.

Another component is to evaluate local attitudes and resource use. Information that has been gathered in the focal communities includes qualitative studies using in-depth interviews and case studies (e.g., Rapid Rural Appraisal techniques, focus groups), quantitative surveys using questionnaires (e.g., household surveys, park visitors), and field observations and analysis of secondary data.

In order to better understand human-wildlife conflicts, the location, type, extent, and frequency of wildlife disturbances is being measured by visiting communities on a regular schedule, talking with affected villagers, and mapping the disturbance areas. Newspaper reports of human-wildlife conflicts will be collected to obtain a historical record of human-wildlife conflicts in this area as well as to evaluate how local news is presented relative to its accuracy, bias and interpretation.



Community meetings and field surveys have already been undertaken in ten villages in three different *kecamatan* along the southeastern perimeter of the park. From this database, a comprehensive Indonesian language survey questionnaire was developed to quantitatively evaluate current and evolving attitudes of residents in these villages. Plans to interview every household will be accomplished through the assistance of University of Lampung students. Methods to monitor and estimate the extent of human activities in the park are being developing using interviews, GPS units and passive infrared monitoring units.

### **Park Support and Law Enforcement**

It is no secret that tiger bones in particular are a lucrative international black-market product for use in Traditional Chinese Medicine (Mills and Jackson, 1996). Fortunately, the poaching of tigers in Sumatra is not rampant (Tilson and Traylor-Holzer, 1994; Bowles and Plowden, in press), as it is in other countries like India, Vietnam, Laos and Cambodia (Mills and Jackson, 1996). Nevertheless, the temptation for poachers to ply their trade in Sumatra will always be present, and PHPA must be ever vigilant in its resistance to it. Wildlife law enforcement by PHPA needs to be strengthened (Ministry of Forestry, 1994) and one approach is described here.

In 1990 the Minnesota Zoo initiated an "Adopt-A-Park" program to provide direct assistance to conservation efforts in Ujung Kulon National Park, West Java, Indonesia. This program helps protect wild animal populations and ecosystems by providing support to park rangers and guards in the form of equipment and new or renovated guard posts (Tilson, 1991; Tilson, 1995b).

This conservation effort was expanded in 1996 to Way Kambas National Park, which became the Minnesota Zoo's second "adopted" park, in conjunction with a companion program by the Minnesota Conservation Officers Association, called Adopt-A-Warden, which provides equipment and law enforcement training to park rangers and guards in both Ujung Kulon and Way Kambas parks (Breining, 1994; Tilson, 1996). These combined programs strengthen the effectiveness of PHPA in its protection of wild tigers, their prey and their habitat.

### **Development of *Ex Situ* Tiger Programs in Indonesia**

The precarious status of the Sumatran tiger in the wild called for immediate initiation of a captive management program for the subspecies in Indonesia (Tilson *et al.*, 1993). These programs for captive populations were developed by the Perhimpunan Kebun Binatang Se Indonesia (PKBSI)(Tilson *et al.*, 1996a). Because the Indonesian government had already designated Taman Safari Indonesia (TSI) as the Indonesian Center for the Reproduction of Endangered Wildlife, it was also designated as the official repository for wild-caught "problem" Sumatran tigers by the Directorate General of PHPA and was selected as the site for construction of a modern zoo tiger breeding facility. The development of the PKBSI Sumatran Tiger Masterplan is specifically linked to *in situ* programs described here (Manansang *et al.*, in press). The process and involvement of international regional programs and organizations in the development of the PKBSI captive management program for tigers is reviewed elsewhere in Tilson *et al.* (1996b).

One example of a collaborative project that the PKBSI has developed with PHPA is a tiger rescue team. The team's primary function is to provide capture expertise and logistical support to

remove "problem" tigers from protected areas in Sumatra rather than having them killed by villagers, police or the military. Problem tigers, as defined by PHPA, are tigers that leave officially protected forests and come into conflict with villages, usually by killing their livestock or domestic animals. Tigers that kill villagers inside protected areas are not considered problem tigers. Another linkage is the production of an educational brochure about the tiger rescue team for distribution to government and civic offices throughout Sumatra. PKBSI is also considering the potential contribution of a Genome Resource Bank to the long-term survival of wild tigers (Wildt *et al.*, 1995). Most importantly, the *ex situ* components of the PKBSI are integrated with *in situ* components, and together they comprise the *Indonesian Sumatran Tiger Conservation Strategy*. It is an outstanding achievement illustrating how government conservation agencies, in this case the Ministry of Forestry, can work hand in hand with local zoo organizations, in this case, PKBSI and Taman Safari Indonesia.

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A gut-wrenching primeval fear electrified his spine and literally raised the hair on the back of his neck. Alone and on foot, Ron Tilson didn't see the tiger: just the cat's paw prints in the streambed – water beginning to trickle into the fresh indentations.

The animal had walked by less than a minute before and was probably watching from the undergrowth. As Tilson regained control of his legs, he moved tentatively back the way he had come.

Tilson – now director of conservation at the Minnesota Zoo, coordinator of the World Conservation Union's Tiger Global Animal Survival Plan and one of the world's foremost authorities on tigers – has never forgotten the hammering chest, the enveloping chill and the feeling of utter defenselessness during that encounter in Assam, India.

In an instant he had felt the raw power that has made the tiger both feared and revered by villagers and forest dwellers throughout Asia.

His awe and respect for these magnificent jungle cats undiminished since that first encounter 23 years ago, Tilson is working hard to shorten the odds against their extinction and, if possible, turn the tide toward long-term survival of all remaining

tiger subspecies. With the aid of the World Conservation Union's Species Survival Commission, zoological organizations, universities, governments and major financial backing from Exxon Corporation, he has become involved with a number of tiger conservation programs across Asia.

High on the list is the work being done in the Sumatran tiger project in Indonesia, a model for survival programs throughout Asia. Central to this effort is a four-year field program in the Way Kambas National Park in southeastern Sumatra. It aims to learn more about tigers and what will be needed to save them.

"Despite the high profile of the tiger in zoos and circuses around the world, there is very little known about the animal and its habits," Tilson explains. "That surprises many people. But the tiger is a secretive, solitary cat that will generally avoid contact with humans in the wild.

"Our best guess is that only 400 to 500 Sumatran tigers remain in the wild – with possibly as few as 20 in the Way Kambas park." First stages of the program call for a census using remote cameras and

monitoring 10 or more tigers in the park via radio collars.

"We want to establish a set of life-history characteristics that will form the basis for developing effective interventional management strategies for wild populations," he explains.

While Tilson oversees the program, on-the-spot manager for the Way Kambas operation is Neil Franklin, a post-graduate biology-zoology student from York University in England. No stranger to the Sumatran bush, having spent some of his childhood in the region, Franklin has set up camp in a clearing alongside a ranger station in the park.

Working in places where dense undergrowth often makes progress impossible on foot and the overhead canopy completely shuts out the sky, Franklin and his team of 12 or so Indonesian researchers cut narrow trails into the jungle in search of tiger signs and likely places to set up census cameras.

The task ahead is not for the faint-hearted. Temperatures hover around 85 degrees Fahrenheit and "the humidity is thick enough to drink." Heavy, year-round rainfall keeps clothing and

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by Rick Wilkinson

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equipment always damp.

What's more, the jungle has a number of unfriendly inhabitants besides tigers – the cobra for one – to watch out for. Franklin, recently involved in a survey of the endangered Sumatran rhino, shrugs these things aside as he focuses on his work with tigers.

“We hope to use trained elephants to help as transport about the park,” he says. “They can negotiate the forest better than vehicles.”

The census plan starts with 30 weatherproof automatic cameras and hopes to build up to about 60.

“We set them up in pairs – on either side of a suspected tiger trail and fixed to trees about half a meter above-ground. Animals trigger the cameras by breaking an invisible infrared beam. We hope that using the two cameras will get us a snap from both

sides at once, whether it's a tiger, his prey or some other animal.” (A tiger's stripes on the left side do not match those on the right.)

Setting up cameras is kid's play compared with collaring tigers on the run in the wild. “We'll locate each radio-collared animal every few days,” says Franklin. “Each week the team will also do more intense 24-hour monitoring on a focal animal and plot its movements on air photos so that the tracks can be transferred to base maps of the region.

“Geographical Information Systems software matches the data with satellite imagery of vegetation cover as well as with land use and forest status maps. If possible the team will observe social and predatory behavior and note interactions with other tigers.”

An equally important aim of the Way Kambas pro-

gram is to ascertain human needs of forest resources and to develop a conflict resolution process where these needs overlap those of the tigers.

The project includes plans for a careful poll of village elders, representative households and a statistically valid sample of the population surrounding the park to evaluate attitudes toward hunting, poaching, land use and conservation.

“It's important that we establish a community-based education program to decrease tension in human-tiger interactions and to demonstrate how to share the forest resources equitably,” Tilson says.

Support for this concept reaches to the top echelons of the Indonesian government. Dwiatmo Siswomartono, director for Nature, Flora and Fauna Conservation within the Indonesian forestry ser-

vice, has translated the Sumatran tiger conservation program into Indonesian himself so that the information can be used in leaflets and brochures in Sumatra.

“It is critical that the people understand this program,” he says. “Without their participation it won't work. We intend to distribute the information as widely as possible through the national media, in the schools and perhaps even at the army Staff College in Jakarta.”

Tony Soehartono, the forestry officer in direct contact with the Sumatran tiger project, agrees: “With Esso providing funding for technical advice and facilities for training Indonesian staff, the program will form the basis for impressing on the local population that tigers and all wildlife belong to the people of the world and that the villagers have some



*Neil Franklin (left) and Ron Tilson set up one of the weatherproof cameras used to track tigers in the jungles of Sumatra as part of a census program. Animals trigger pairs of cameras by breaking an invisible infrared beam. Only 400 to 500 Sumatran tigers survive in the wild.*





*Tiger experts (from left) Neil Franklin, Ron Tilson and Jansen Manansang examine playful cubs at a park and wild animal breeding center in Indonesia. Manansang, managing director of the center, says that model breeding programs for endangered species are insurance against their demise in the wild.*

responsibility for the survival of the species.”

Ron Tilson is confident that field teams trained at Way Kambas will be able to move up through the other Sumatran national parks and game reserves, gathering vital definitive data on the island’s tigers and their habitats.

His confidence in the Sumatran tiger’s survival prospects is bolstered further by the good progress of a parallel program of captive breeding of the native cats conducted by Taman Safari Indonesia.

Taman Safari is a drive-through safari park. On a former tea plantation in the hills of Java, it’s some 43 miles outside Indonesia’s capital of Jakarta, a thriving metropolis of 8.2 million people. The park’s more than 1,000 animals represent 130 species from five continents. But as co-founder and Managing Director Jansen Manansang explains, the park is more

than just a collection of animal exhibits for the public.

“From the beginning we were determined to develop model breeding programs for endangered species as an insurance against their demise in the wild. We’ve had remarkable success with a number of species, including the tiger, he says. “But, captive breeding is only part of the larger operation of capture, breeding and return to the wild.”

Working with Tilson and designers from the Minnesota Zoo, Manansang has established a specialist breeding facility for tigers at the Taman Zoo. Because of the problem of inbreeding and cross-subspecies breeding in zoos around the world, the initial aim is to breed animals caught in the wild – starting with the Sumatran tiger – to preserve the purity of the subspecies.

The work includes training zoo staff in animal health and

husbandry. It involves blood sampling and tissue biopsies for DNA analysis, plus collection of sperm from genetically important males. An Indonesian tiger genome resource bank will serve as a genetic backup to wild populations.

Taman has also established a Sumatran tiger studbook. Compiled by Ligaya Tumbelaka from Java’s Bogor Agriculture University, the data base provides location details and pedigree information on all captive Sumatran tigers in Indonesia. It makes for positive identifications in captive breeding programs.

The Taman Zoo has become the model for tiger training and research in Asia. Similar facilities are needed in other countries with critically endangered wild tigers – particularly Malaysia, Thailand, Laos, Vietnam and China.

What’s more, in conjunction with greater knowledge of tigers from the life history

and census data gathered from field programs, Tilson believes that, using sperm from the Taman Genome Resource Bank, it may even be possible in the future to apply techniques such as artificial insemination and in-vitro fertilization to immobilized animals.

“The captive breeding program, running in parallel with field studies and education efforts to protect wild populations, represents an unprecedented linkage between tigers in zoos and those in preserves,” he says. “It’s never been done before and it represents a new vision to save tigers.

“There’s still a huge challenge ahead, but the Indonesian program illustrates just what can be achieved when governments, corporations and biological conservationists combine their efforts to develop and implement a conservation management strategy.”