

# Second International Tapir Symposium

Panama City, Republic of Panama  
January 10-16, 2004

## TAPIR SYMPOSIUM



**2004 PANAMA**

## Symposium Program Schedule and Presentation Abstracts

**IUCN**  
The World Conservation Union



IUCN Species Survival Commission (SSC)  
Tapir Specialist Group (TSG)



American Zoo and Aquarium Association (AZA)  
Tapir Taxon Advisory Group (TAG)



## PLANNING COMMITTEE

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### ORGANIZATIONS

IUCN Species Survival Commission (SSC) Tapir Specialist Group (TSG)

American Zoo and Aquarium Association (AZA) Tapir Taxon Advisory Group (TAG)

### PLANNING COMMITTEE

#### PATRÍCIA MEDICI

Conservation Biologist, IPÊ - Institute for Ecological Research, Brazil

Chair, IUCN/SSC Tapir Specialist Group (TSG)

#### RICK BARONGI

Director, Houston Zoo Inc., United States

Member, American Zoo and Aquarium Association (AZA) Tapir Taxon Advisory Group (TAG)

Member, IUCN/SSC Tapir Specialist Group (TSG)

#### ALBERTO MENDOZA

Community Programs Coordinator, Houston Zoo Inc., United States

#### PHIL SCHAEFFER

Zoologist/Conference Planner and Registrar, Caligo Ventures, Inc., United States

#### CHARLES R. FOERSTER

Biologist, Baird's Tapir Project, Corcovado National Park, Costa Rica

Deputy-Chair, IUCN/SSC Tapir Specialist Group (TSG)

#### KELLY RUSSO

Communications Specialist, Houston Zoo Inc., United States

## INSTITUTIONAL SUPPORT

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Africam Safari, Mexico

ANCON Expeditions, Republic of Panama

Belize Zoo, Tropical Education Center, Belize

Colombian Tapir Network, Colombia

Conservation International, United States

Copenhagen Zoo, Denmark

European Association of Zoos and Aquaria (EAZA) Tapir Taxon Advisory Group (TAG)

Houston Zoo Inc., United States

Idea Wild, United States

IPÊ - Institute for Ecological Research, Brazil

IUCN/SSC Conservation Breeding Specialist Group (CBSG)

Municipality of Panama City, Republic of Panama

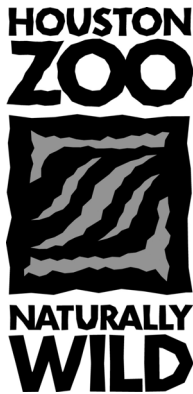
Tapir Preservation Fund (TPF), United States

Virginia Zoological Gardens, United States



## FINANCIAL SUPPORT

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Africam Safari, Mexico  
Beardsley Zoological Gardens, USA  
Belize Zoo, Tropical Education Center, Belize  
Brookfield Zoo, Chicago Board of Trade Conservation Group, USA  
Cali Zoological Foundation, Colombia  
Center for Environmental Conservation and Research (CERC), USA  
Chaffee Zoological Gardens of Fresno, USA  
Chester Zoo, North of England Zoological Society, United Kingdom  
Cleveland Zoological Society, Cleveland Metroparks Zoo, Scott Neotropical Fund, USA  
Copenhagen Zoo, Denmark  
Detroit Zoological Institute, USA  
Disney Wildlife Conservation Fund, USA  
El Colegio de la Frontera Sur, Mexico  
El Paso Zoo, USA  
Fresno Zoological Society, USA  
Fundación Temaikén, Argentina  
Hattiesburg Zoo, USA  
Idea Wild, USA  
International Animal Exchange, USA  
IUCN/SSC Conservation Breeding Specialist Group (CBSG)  
Los Angeles Zoo, USA  
Marwell Zoological Park, United Kingdom  
Miami Metro Zoo, USA  
Miejski Ogród Zoologiczny Lodz, Poland  
Milwaukee County Zoological Gardens, USA  
Mountain View Conservation & Breeding Center, Canada  
Nashville Zoo at Grassmere, USA  
Omaha Zoological Society, Henry Doorly Zoo, USA  
Paignton Zoological & Botanical Gardens, United Kingdom  
Palm Beach Zoo at Dreher Park, USA  
Parc Zoologique Doué-la-Fontaine, France  
Parc Zoologique de Lille, France  
Peace River Refuge, USA  
Rotterdam Zoo, The Netherlands  
Sedgwick County Zoo, USA  
Ueno Zoo and Tama Zoo, Tokyo Zoo Conservation Fund, Japan  
University of Florida, USA  
Virginia Zoological Gardens, USA  
White Oak Conservation Center, USA  
Wildlife Conservation Society, Argentina  
Wildlife World Zoo Inc., USA  
Zoo Conservation Outreach Group (ZCOG) c/o Audubon Park Zoological Garden, USA

# GENERAL PROGRAM



DAY	MORNING	AFTERNOON	EVENING
<b>Jan. 10</b> (Sat.)	09:00 - 18:00 Arrival and Registration		19:00 Opening Night Reception
<b>Jan. 11</b> (Sun.)	08:00 - 09:00 Welcome to Participants 09:00 - 10:00 Keynote Speaker <b>William Konstant</b> 10:00 - 10:30 Coffee Break & Poster Session 10:30 - 11:50 Paper Session 1 <b>Lowland Tapirs</b> 11:50 - 12:30 Paper Session 2 <b>Malayan Tapirs</b> 12:30 - 14:00 Lunch	14:00 - 15:20 Paper Session 3 <b>Mountain Tapirs</b> 15:20 - 16:00 Paper Session 4 <b>Baird's Tapirs</b> 16:00 - 16:30 Coffee Break & Poster Session 16:30 - 17:10 Paper Session 5 <b>General Topics</b> 17:10 - 18:10 Questions for Paper Presenters	19:00 - 20:00 Keynote Speaker <b>Patricia Medici</b> 19:00 - 22:00 Auctions
<b>Jan. 12</b> (Mon.)	08:00 - 09:00 TSG COMMITTEES; Reports 09:00 - 10:00 Keynote Speaker <b>Matthew Colbert</b> 10:00 - 10:30 Coffee Break & Poster Session 10:30 - 12:30 Workshop 1 <b>Tapir Genetics: A Concerted Effort</b> 12:30 - 14:00 Lunch	14:00 - 16:00 Workshop 2 - Part A <b>Tapir Husbandry and Captive Management</b> 16:00 - 16:30 Coffee Break & Poster Session 16:30 - 18:00 Workshop 2 - Part B <b>Tapir Husbandry and Captive Management</b>	19:00 - 20:00 Keynote Speaker <b>Dr. Stanley Heckadon-Moreno</b>
<b>Jan. 13</b> (Tue.)	Mid-Conference Field Trips		
<b>Jan. 14</b> (Wed.)	08:00 - 10:00 Workshop 3 - Part A <b>Action Planning for Tapir Conservation</b> 10:00 - 10:30 Coffee Break 10:30 - 12:30 Workshop 3 - Part B <b>Action Planning for Tapir Conservation</b> 12:30 - 14:00 Lunch	14:00 - 16:00 Workshop 4 - Part A <b>Fundraising</b> 16:00 - 16:30 Coffee Break 16:30 - 18:00 Workshop 4 - Part B <b>Fundraising</b>	19:00 - 20:00 Keynote Speaker <b>Wally van Sickle</b>
<b>Jan. 15</b> (Thu.)	08:00 - 10:00 Workshop 5 - Part A <b>TSG Plans for Action</b> 10:00 - 10:30 Coffee Break 10:30 - 12:00 Workshop 5 - Part B <b>TSG Plans for Action</b> 12:00 - 14:00 Lunch	14:00 - 16:00 Workshop 5 - Part C <b>TSG Plans for Action</b> 16:00 - 16:30 Coffee Break 16:30 - 18:00 Workshop 5 - Part D <b>TSG Plans for Action</b>	19:00 - 24:00 Final Banquet Dinner
<b>Jan. 16</b> (Fri.)	Departure and Transfers to Airport - Post Conference Tours Begin.		



## DETAILED PROGRAM

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### ▲ SATURDAY - January 10 ▲

ARRIVAL AND REGISTRATION - Conference Administration Room

OPENING NIGHT RECEPTION - Salon Bolivar "A"

### ▲ SUNDAY - January 11 ▲

#### ▲ MORNING

#### 08:00 - 09:00 OPENING SESSION - Salon Bolivar "A"

08:00 - 08:30 **Juan Carlos Navarro**, Mayor of Panama City

08:30 - 08:45 **Rick Barongi and Lewis Greene**, AZA Tapir Taxon Advisory Group (TAG)

08:45 - 09:00 **Patrícia Medici**, Chair, IUCN/SSC Tapir Specialist Group (TSG)

#### 09:00 - 10:00 KEYNOTE SPEAKER 1 - Salon Bolivar "A"

Are Tapirs Good Flagship Species for Wildlife Conservation?

**William Konstant**

Conservation International, USA

#### 10:00 - 10:30 COFFEE BREAK (Lobby) & POSTER SESSION (Salon Azul)

#### 10:30 - 11:50 PAPER SESSION 1: Lowland Tapirs (Salon Bolivar "A")

Chair: **Patrícia Medici**

10:30 - 10:50 Lowland Tapir at the Amazonas-Putumayo-Napo Region at the Peruvian Amazon: Effects of Human Pressure on Tapir Abundance.

**Olga L. Montenegro**

Ph.D. Graduate Student, University of Florida, USA

10:50 - 11:10 Tapir (*Tapirus terrestris*) Habitat Use Related to Cattle Presence in El Rey National Park, Salta, Argentina.

**Silvia C. Chalukian**

Wildlife Conservation Society, Argentina

11:10 - 11:30 Diet of Lowland Tapir (*Tapirus terrestris*) at the Yavari-Miri River, Northeastern Peruvian Amazon.

**Olga L. Montenegro**

Ph.D. Graduate Student, University of Florida, USA

11:30 - 11:50 Anesthetic Protocols Used on *Tapirus terrestris* in Venezuela

**Pilar Alexander Blanco Márquez**

D.V.M., INPARQUES, Venezuela / Earthmatters.org

#### 11:50 - 12:30 PAPER SESSION 2: Malayan Tapirs (Salon Bolivar "A")

Chair: **Rick Barongi**

11:50 - 12:10 Behavioral Ecology of the Malayan Tapir, *Tapirus indicus*.

**Carl Traeholt**

Research Coordinator, Malayan Tapir Project, Krau Wildlife Reserve, Malaysia

12:10 - 12:30 Asian Tapir Management at Mountain View Conservation Center, With Some Notes on the Management of a Female Mountain Tapir.

**Douglas M. Richardson**

General Curator, Mountain View Conservation Center, Canada

#### 12:30 - 14:00 LUNCH

# DETAILED PROGRAM



## ▲ AFTERNOON

### 14:00 - 15:20 PAPER SESSION 3: Mountain Tapirs - Salon Bolivar "A"

Chair: **Alberto Mendoza**

14:00 - 14:20 Food Availability and Use by Mountain Tapir (*Tapirus pinchaque*) in the Central Andes of Colombia.

**Diego J. Lizcano**

Durrell Institute of Conservation and Ecology, DICE, University of Kent, United Kingdom

14:20 - 14:40 Action Plan for the Conservation of the Mountain Tapir (*Tapirus pinchaque*) in the Colombian Coffee Growing Region.

**Jaime Andres Suárez Mejía**

Facultad de Ciencias Ambientales, Universidad Tecnológica de Pereira, Colombia

14:40 - 15:00 Mountain Tapir Conservation Project in the South of the Central Andes of Colombia.

**Sergio Sandoval Arenas**

Cali Zoological Foundation, Colombia

15:00 - 15:20 Remnant Habitat for Mountain Tapirs at the Northeastern Andes of Colombia.

**Olga L. Montenegro**

Ph.D. Graduate Student, University of Florida, USA

### 15:20 - 16:00 PAPER SESSION 4: Baird's Tapirs - Salon Bolivar "A"

Chair: **Charles R. Foerster**

15:20 - 15:40 A Correlation Factor to Estimate Baird's Tapir Population Density in the Rainforest.

**Juan de Dios Valdez Leal**

Programa Regional en Manejo de Vida Silvestre, Universidad Nacional, Costa Rica

15:40 - 16:00 Ecology of Baird's Tapir in a Cloud Forest of Southeastern Mexico.

**Iván Lira Torres**

Instituto de Ecología, Universidad del Mar - Campus Puerto Escondido, Mexico

### 16:00 - 16:30 COFFEE BREAK (Lobby) & POSTER SESSION (Salon Azul)

### 16:30 - 17:10 PAPER SESSION 5: General Topics - Salon Bolivar "A"

Chair: **Patrícia Medici**

16:30 - 16:50 The Influence of Large Herbivores on Neotropical Forests.

**Charles R. Foerster**

Baird's Tapir Project Leader, Corcovado National Park, Costa Rica

16:50 - 17:10 Conservation of the Baird's and Lowland Tapirs Through In-situ Partnerships.

**Jessica Hoffman**

Graduate Student, Masters of Agriculture in Natural Resource Development, Fossil Rim Wildlife Center, USA

### 17:10 - 18:00 QUESTIONS FOR PAPER PRESENTERS

## ▲ EVENING

### 19:00 - 20:00 KEYNOTE SPEAKER 2 - Salon Bolivar "A"

The TSG Conservation Fund: History and 2003 Report.

**Patrícia Medici**

Chair, IUCN/SSC Tapir Specialist Group (TSG), Brazil

### 19:00 - 22:00 AUCTIONS: Fundraising for the TSG Conservation Fund (TSGCF).



## DETAILED PROGRAM

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### MONDAY - January 12

#### ▲ MORNING

##### 08:00 - 09:00 TAPIR SPECIALIST GROUP COMMITTEES: Reports - Salon Bolivar "A"

Chair: **Patrícia Medici**

08:00 - 08:30 The Tapir Specialist Group Zoo Committee.

**Siân S. Waters**

Coordinator, TSG Zoo Committee, UK

08:30 - 09:00 The Tapir Specialist Group Veterinary Committee.

**Pilar Alexander Blanco Márquez**

D.V.M., Member, TSG Veterinary Committee, Venezuela

##### 09:00 - 10:00 KEYNOTE SPEAKER 3 - Salon Bolivar "A"

Estimating the Maturity of Tapirs Using Skeletal and Dental Indicators.

**Matthew Colbert**

The University of Texas at Austin, Department of Geological Sciences, USA

##### 10:00 - 10:30 COFFEE BREAK (Lobby) & POSTER SESSION (Salon Azul)

##### 10:30 - 12:30 WORKSHOP 1 - Salon Bolivar "A"

Tapir Genetics: A Concerted Effort.

**Anders Gonçalves da Silva**

Ph.D. Graduate Student, Center for Environmental Research and Conservation,  
Columbia University, USA

**Javier Adolfo Sarria-Perea**

D.V.M., M.Sc. Graduate Student, FCAV UNESP, Brazil

##### 12:30 - 14:00 LUNCH

#### ▲ AFTERNOON

##### 14:00 - 16:00 WORKSHOP 2: Part A - Salon Bolivar "A"

Tapir Husbandry and Captive Management.

14:00 - 15:00 The American Zoo and Aquarium Association (AZA) Tapir Taxon Advisory Group (TAG) Action Plan.

**Lewis Greene**

Chair, AZA Tapir Taxon Advisory Group (TAG); Director, Virginia Zoo, USA

**Rick Barongi**

Member, AZA Tapir Taxon Advisory Group (TAG); Director, Houston Zoological Gardens, USA

15:00 - 15:30 2003 Management Plans for Captive Tapirs in North America.

**Alan H. Shoemaker**

Special Advisor, AZA Tapir Taxon Advisory Group (TAG), USA

15:30 - 16:00 The European Association of Zoos and Aquaria (EAZA) Tapir Taxon Advisory Group (TAG) - A Report.

**Bengt Holst**

Chair, EAZA Tapir Taxon Advisory Group (TAG); Vice-Director, Copenhagen Zoo, Denmark

##### 16:00 - 16:30 COFFEE BREAK (Lobby) & POSTER SESSION (Salon Azul)



## DETAILED PROGRAM



### 16:30 - 18:00 WORKSHOP 2: Part B - Salon Bolivar "A"

Tapir Husbandry and Captive Management.

16:30 - 17:00 Tapirs and Panama, from a Captive Perspective

**Rick Barongi**

Director, Houston Zoological Gardens, USA; Member, AZA Tapir Taxon Advisory Group (TAG)

17:00 - 17:30 The New Tapir Exhibit at the Summit Zoo, Panama City.

**Alberto Mendoza**

Community Programs Coordinator, Houston Zoological Gardens, USA

17:30 - 18:00 Hormonal and Ultrasonography Studies During the Pregnancy of Lowland Tapir

**Viviana B. Quse**

TEMAIKEN Foundation, Department of Animal Health, Argentina

### ▲ EVENING

### 19:00 - 20:00 KEYNOTE SPEAKER 4 - Salon Bolivar "A"

Panama, the land and the people.

**Dr. Stanley Heckadon-Moreno**

Director of Communications and Public Programs, Smithsonian Tropical Research Institute (STRI)

## ■ TUESDAY - January 13 ■

### MID-CONFERENCE FIELD TRIPS.

## ■ WEDNESDAY - January 14 ■

### ▲ MORNING

### 08:00 - 10:00 WORKSHOP 3: Part A - Salon Bolivar "A"

Action Planning for Tapir Conservation.

08:00 - 09:00 The National Programme for Tapir Conservation and Recovery in Colombia.

**Olga L. Montenegro**

Ph.D. Graduate Student, University of Florida, USA

09:00 - 10:00 Mexico's National Plan for Tapir Conservation and Recovery.

**Eduardo J. Naranjo Piñera**

El Colegio de la Frontera Sur, Mexico

### 10:00 - 10:30 COFFEE BREAK (Lobby)

### 10:30 - 12:30 WORKSHOP 3: Part B - Salon Bolivar "A"

Action Planning for Tapir Conservation.

10:30 - 11:30 Managing the Human Animal: CBSG's Population and Habitat Viability Assessment (PHVA) Workshop Process for Species Action Planning.

**Phillip S. Miller**

Senior Program Officer, IUCN/SSC Conservation Breeding Specialist Group (CBSG), USA

11:30 - 12:30 Malay Tapir Workshop in Malaysia.

**Bengt Holst**

Chair, EAZA Tapir Taxon Advisory Group (TAG); Vice-Director, Copenhagen Zoo, Denmark

### 12:30 - 14:00 LUNCH



## DETAILED PROGRAM

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### ▲ AFTERNOON

#### 14:00 - 16:00 WORKSHOP 4: Part A - Salon Bolivar "A"

Fundraising.

Practical Ideas and Useful Tips to Raise Funds for Tapir Conservation Projects.

**Wally van Sickle**

President, Idea Wild, USA

**Patrícia Medici**

Chair, IUCN/SSC Tapir Specialist Group (TSG), Brazil

#### 16:00 - 16:30 COFFEE BREAK (Lobby)

#### 16:30 - 18:00 WORKSHOP 4: Part B - Salon Bolivar "A"

Fundraising.

Web Design as Conservation: Marketing and Fundraising Strategies for the New TSG Website and Conservation Fund.

**Gilia Angell**

Web/Graphics Designer, Amazon.com, USA

### ▲ EVENING

#### 19:00 - 20:00 KEYNOTE SPEAKER 5 - Salon Bolivar "A"

Idea Wild: Supporting the Heroes of the World.

**Wally van Sickle**

President, Idea Wild, USA

## ▼ THURSDAY - January 15 ▼

### ▲ MORNING

#### 08:00 - 10:00 WORKSHOP 5: Part A - Salon Bolivar "A"

TSG Plans for Action

**Phillip S. Miller**

Senior Program Officer, IUCN/SSC Conservation Breeding Specialist Group (CBSG), USA

**Amy Camacho**

General Director, Africam Safari; Convener, CBSG Mexico

#### 10:00 - 10:30 COFFEE BREAK (Lobby)

#### 10:30 - 12:00 WORKSHOP 5: Part B - Salon Bolivar "A"

TSG Plans for Action

#### 12:00 - 14:00 LUNCH

## DETAILED PROGRAM

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### ▲ AFTERNOON

14:00 - 16:00 **WORKSHOP 5: Part C - Salon Bolivar "A"**  
TSG Plans for Action

16:00 - 16:30 **COFFEE BREAK** (Lobby)

16:30 - 18:00 **WORKSHOP 5: Part D - Salon Bolivar "A"**  
TSG Plans for Action

### ▲ EVENING

19:00 - 24:00 **FINAL NIGHT - BANQUET DINNER**

### ▼ **FRIDAY - January 16** ▼

**DEPARTURE AND TRANSFERS TO AIRPORT.  
POST CONFERENCE TOURS BEGIN.**



## LIST OF POSTERS

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### BAIRD'S TAPIRS

#### ▲ COSTA RICA

Conserving Tapirs (*Tapirus bairdii*) to Conserve "La Amistad" International Park, Costa Rica.  
**Fabricio Carbonell** & Isa Torrealba

Habitat Relationships and Population Estimation of Baird's Tapir: A Proposed Investigation.  
**Jason A. Scott** & Steven B. Castleberry

Tapir's Nutrition in Captivity: The Case of the Simon Bolivar Zoo, Costa Rica.  
**Andrea Brenes Soto**

#### ▲ GUATEMALA

Relative Abundance, Movements, Habitat Use and Principal Threats of Tapir (*Tapirus bairdii*) in Laguna Lachuá National Park, Guatemala.  
**José Roberto Ruiz Fumagalli**

#### ▲ MEXICO

Predation of *Tapirus bairdii* by *Puma concolor* and *Panthera onca* in two Biosphere Reserves, Chiapas, Mexico.  
**María Gabriela Palacios Mendoza** & Epigmenio Cruz Aldán

Foraging Habits and Diet of *Tapirus bairdii* in the Sierra Madre of Chiapas, Mexico.  
**Epigmenio Cruz Aldán**, Sergio Guerrero Sanchez, Carlos Chávez Hernández & Darío Marcelino Güiris Andrade

Measurements and Physiologic Constants for a Juvenile Female *Tapirus bairdii* Before and During Its Stay in the Regional Zoo Miguel Álvarez del Toro, Tuxtla Gutiérrez, Chiapas, Mexico.  
Sergio Guerrero Sánchez & **Epigmenio Cruz Aldán**

Diet and Food Habits of Baird's Tapir in a Cloud Forest of Southeastern Mexico.  
**Iván Lira Torres**, Eduardo J. Naranjo Piñera & Darío Marcelino Güiris Andrade

#### ▲ PANAMA

The Role of the Baird's Tapir as Seed Disperser on Barro Colorado Island, Panama.  
**Paula Capece**, **Enzo Aliaga-Rossel**, **Ricardo Moreno** & José Manuel Vieira Fragoso

# LIST OF POSTERS



## LOWLAND TAPIRS

### ▲ BRAZIL

Assessment of the Level of Parasitism in *Tapirus terrestris* in Morro do Diabo State Park, São Paulo, Brazil.  
**George Ortmeier Velastin**, Patrícia Medici, T. Costa & V. N. Teixeira

### ▲ COLOMBIA

Priority Areas for Lowland Tapir Conservation in the Amazon and Orinoco Region, Colombia.  
Juliana Rodríguez, Hugo Fernando López & **Olga L. Montenegro**

Classificatory Systems of the Tapir (*Tapirus terrestris*) in Three Ethnic Groups of the Middle Caquetá River: Might There be Subspecies or Local Populations?

**Adriana Sarmiento**, Fabián Moreno, Daniel Matapí, Carlos Rodríguez & M. Clara van der Hammen

Knowledge of the Natural History of the Tapir (*Tapirus terrestris*) by Three Ethnic Groups of the Middle Caquetá River Region, Colombian Amazon.

**Adriana Sarmiento**, Fabián Moreno, Daniel Matapí, Carlos Rodríguez & M. Clara van der Hammen

### ▲ FRENCH GUIANA

Status of the Lowland Tapir in French Guiana: Hunting Pressure and Threats on Habitats.

**Benoit de Thoisy** & François Renoux

### ▲ PERU

*Tapirus terrestris* Presence in Yanachaga Chemillén National Park, Peru.

**Judith Figueroa**, Manuel Soto & Tomás Siriaco

Use and Commerce of Individual Parts of the Amazonian Tapir (*Tapirus terrestris*) in Peru.

**Judith Figueroa**

### ▲ VENEZUELA

Captive Management of *Tapirus terrestris* at the Chorro de Milla Park Zoo, Mérida, Venezuela.

**Denis Alexander Torres** & Rodríguez-Hernández, A.

Ethnozoology of Lowland Tapir (*Tapirus terrestris*) in Venezuela.

**Adrián Naveda-Rodríguez** & Armando Lopez

The Karyotype of *Tapirus terrestris* from Venezuela.

Marisol Aguilera & **Angela Expósito**

The Tapir, *Tapirus terrestris* (Linnaeus, 1758): A Conservation Education Tool within the Center for the Conservation of Animal Diversity in the Buffer Zone of Turuepano National Park, Venezuela.

Salvador Boher B., **Mariela Forti**, Victor Martínez & Klaus Müller



## LIST OF POSTERS

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### ▶ MALAYAN TAPIRS ◀

#### ▶ INDONESIA

Habitat Use by Malayan Tapir (*Tapirus indicus*) in West Sumatra  
**Wilson Novarino**, M. Silmi & M. Syafri

#### ▶ MALAYSIA

Capture Methods of Malayan Tapirs.  
**Siti Khadijah Abd Ghani** & Carl Traeholt

Fitting a Radio Transmitter on a Malayan Tapir Without the Use of Anesthetics.  
**Siti Khadijah Abd Ghani** & Carl Traeholt

#### ▶ CAPTIVITY

An Investigation of Factors That Potentially Affect Eye Health of the Malayan Tapir - *Tapirus indicus* - In Captivity.  
**Justine Powell**

### ▶ MOUNTAIN TAPIRS ◀

#### ▶ COLOMBIA

Clinical and Biological Study of a Dead Mountain Tapir (*Tapirus pinchaque*) in Cali Zoological Park:  
A Case Report.  
**Delio Orjuela Acosta**, Maria Alejandra Arango, Jorge Gardeazabal, Karina Martínez & Lorena Ospina

Mountain Tapir (*Tapirus pinchaque*) - Human, Conflict and Priority Areas for Conservation in the  
Central Andes of Colombia.  
**Diego J. Lizcano**

Potential Conservation Areas and Mountain Tapir (*Tapirus pinchaque*) Conflict Zones in the  
Colombian Coffee Growing Region.  
**Jaime Andres Suárez Mejía** & Diego J. Lizcano

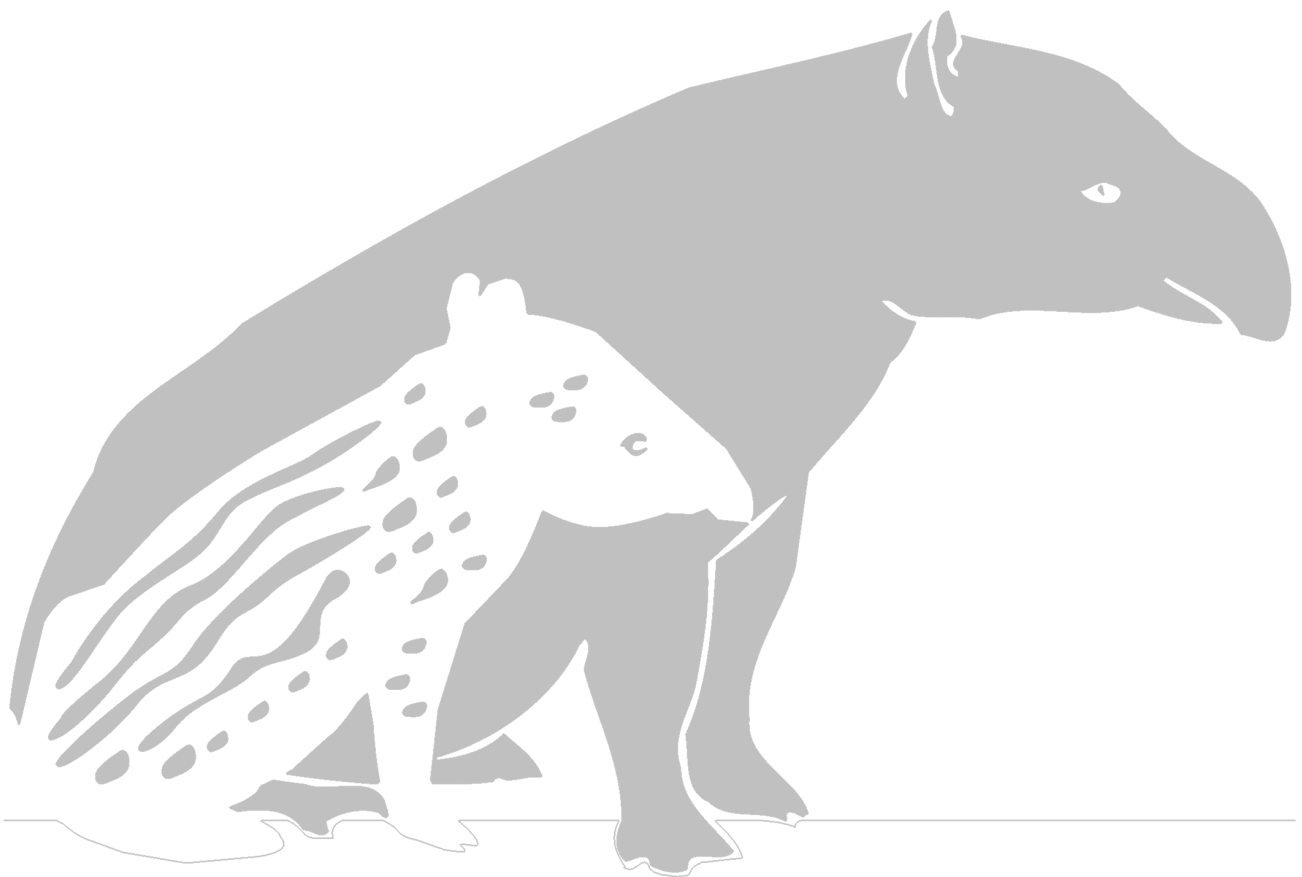
### ▶ GENERAL TOPICS ◀

#### ▶ COLOMBIA

Promoting Knowledge and Discussion About Tapir Ecology and Conservation in Colombia.  
**Diego J. Lizcano** & Sergio Sandoval Arenas

# **ABSTRACTS**

## **Keynote Speakers**







## KEYNOTE SPEAKERS



### Are Tapirs Good Flagship Species for Wildlife Conservation?

#### William Konstant

Conservation International  
1919 M Street, NW, Suite 500, Washington, D.C. 20036, United States  
Phone: +1-215-233-9318; Fax: +1-215-402-0469  
E-mail: b.konstant@conservation.org

The term “flagship species” is routinely used with regard to the use of selected plants and animals as foci for conservation programs, as are other terms such as “charismatic mega-vertebrate”, “indicator species” and “keystone species”. The creatures in question possess some special characteristics or innate appeal that apparently makes them desirable symbols for large-scale efforts that may help ensure the survival of myriad other species. This presentation examines biological and ecological characteristics of tapirs that place them in one or more of the categories mentioned above. It also seeks to determine how tapirs can best be utilized in ongoing efforts to protect other threatened species and habitats throughout their combined ranges. The presentation concludes with a look at how the Houston Zoo is beginning to use tapirs as the principal focus of its overall wildlife conservation efforts.

### The TSG Conservation Fund: History and 2003 Report

#### Patrícia Medici

Research Coordinator, Lowland Tapir Project, IPÊ - Institute for Ecological Research  
Chair, IUCN/SSC Tapir Specialist Group (TSG)  
Avenida Perdizes, 285, Vila São Paulo, Teodoro Sampaio, CEP: 19280-000, São Paulo, Brazil  
Phone & Fax: +55-18-3282-4690  
E-mail: epmedici@uol.com.br

The Tapir Specialist Group Conservation Fund (TSGCF) was established in 2003 as a vehicle to raise and contribute funds towards tapir conservation initiatives. The organizations involved in the management of the TSGCF are the Tapir Specialist Group (TSG), the Houston Zoological Gardens, the Tapir Preservation Fund (TPF), the American Zoo and Aquarium Association (AZA) Tapir Taxon Advisory Group (TAG), and the European Association of Zoos and Aquaria (EAZA) Tapir Taxon Advisory Group (TAG), which are today the key groups working on coordinating and implementing tapir research, conservation and management programs. The money in this Fund consists of personal donations from tapir researchers, supporters and enthusiasts worldwide, as well as contributions from conservation organizations and tapir holding institutions and zoos. A TSGCF committee reviews each application submitted and decides to fund projects based on the merits of each proposal, significance for tapir conservation, and several other criteria. Grants are given to projects targeted at research with wild and/or captive tapirs; projects targeted at restoration, protection and conservation of tapir habitat in South and Central America and Southeast Asia; education and capacity-building programs for local communities within the tapirs' range in South and Central America, and Southeast Asia; and implementation of the recommendations of the IUCN/SSC *Tapir Status Survey and Conservation Action Plan*. The proposals must be cooperative in nature and have matching funds. The proposal must be scientifically significant and sound, logistically feasible, must have a high probability of success and clearly contribute to the conservation of tapirs and their remaining habitats. During the 2003 funding cycle, the TSG Conservation Fund received seven proposals and three of those were selected for funding.



## KEYNOTE SPEAKERS

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### **Estimating the Maturity of Tapirs Using Skeletal and Dental Indicators**

#### **Matthew Colbert**

The University of Texas at Austin, Department of Geological Sciences  
1 University Station C1100 Austin, Texas 78712, United States  
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Many demographic and morphological questions require knowledge about the relative maturity of individual animals. For example, sexual dimorphism in size or shape cannot be adequately addressed unless one accounts for changes in shape or size related to increasing maturity. Unfortunately, most animals, including tapirs, lack longitudinal data documenting sequential changes over the course of an individual's life, and ontogenetic sequences are necessarily based on cross-sectional samples. Although this is usually accomplished by ordering samples into a series based on a criterion such as size, it is clear that variation in size, or any single criterion, can distort patterns of sequence variation and result in misleading maturity estimates. Here, sequences are discovered by analyzing a matrix of scored dental and skeletal characters using a parsimony algorithm (PAUP). Results comprise multiple sequences that can be diagrammed as reticulating networks leading from the least to the most mature individuals. Not only can relative maturity be estimated from these results, but sequence variation can also be compared between species, potentially indicating heterochronic changes in the evolution of *Tapirus*.

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### **Panama, the Land and the People**

#### **Dr. Stanley Heckadon-Moreno**

Director of Communications and Public Programs, Smithsonian Tropical Research Institute (STRI)

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### **IDEA WILD: Supporting the Heroes of the World**

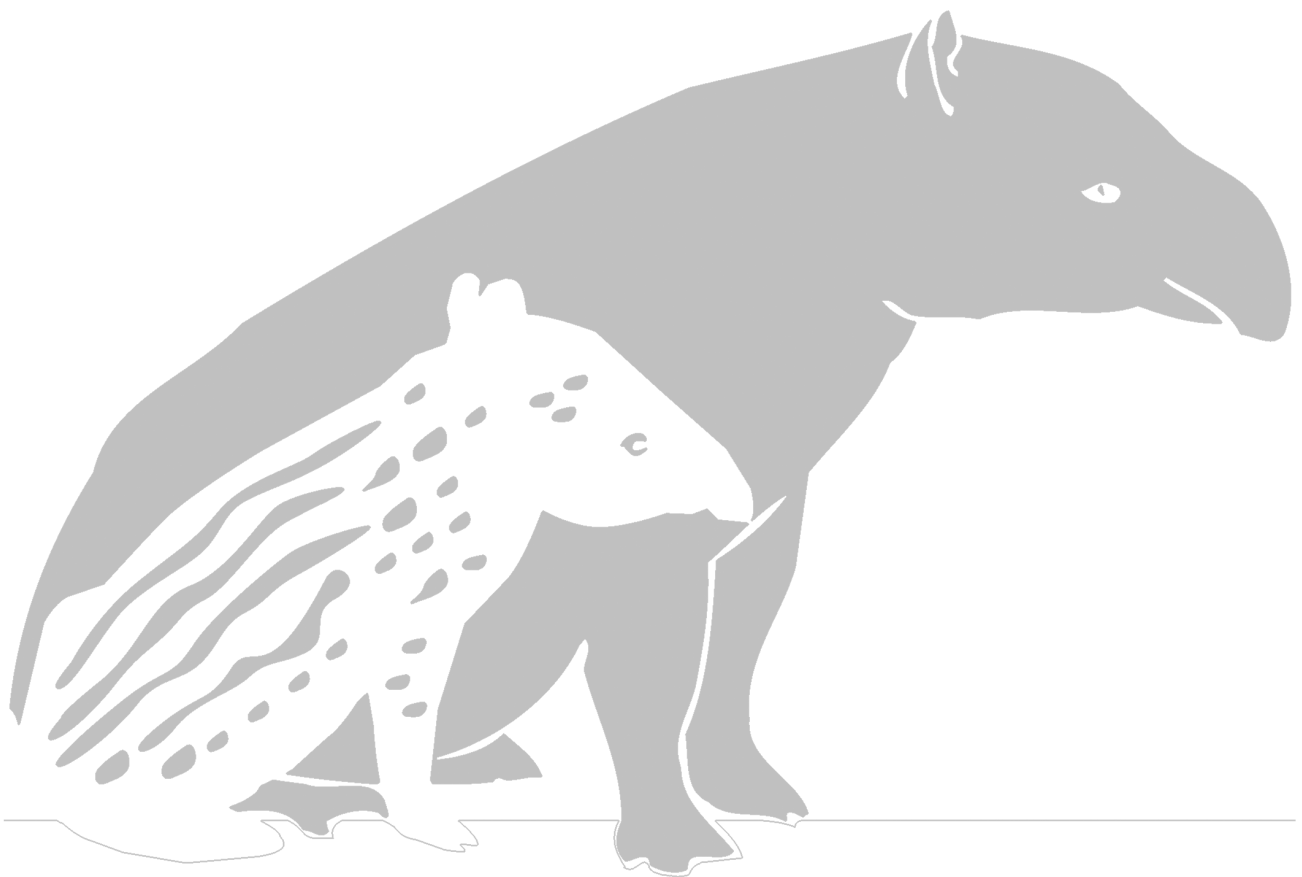
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IDEA WILD is a non-profit organization from the United States working to minimize the loss of biodiversity by empowering people on the front lines of conservation in Latin America with equipment and supplies. We provide binoculars, global positioning systems, mist nets, telemetry, computers, cameras, climbing ropes etc. to biologists and educators working to conserve biodiversity. In ten years we have provided equipment to over 3,000 people in 37 countries. Our slide presentation will introduce you to many of these projects and explain the application process. If you have ever been short of equipment for your conservation research or education efforts, or know someone who has, you do not want to miss this one!

# **ABSTRACTS**

## **Paper Sessions**







### **Lowland Tapir at the Amazonas-Putumayo-Napo Region at the Peruvian Amazon: Effects of Human Pressure on Tapir Abundance**

**Olga L. Montenegro<sup>1</sup>, Mario Escobedo<sup>2</sup>, Debra Moskovits<sup>3</sup>, Corine Vriesendorp<sup>3</sup>,  
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We report contrasting abundance of lowland tapir at three sites of northern Peruvian Amazon. Data come from a rapid biological inventory carried out by the Field Museum of Natural History at the headwaters of Yaguas, Ampiyacu and Apayacu rivers at the northern Peruvian Amazon on August 2003. Habitats in the area include upland, seasonally flooded, swamp and some secondary growth forests. Human pressure differs among the surveyed sites. At the Yaguas River there is almost no human presence, except for one small community at the river's mouth. The site at the Ampiyacu River has slight human impact, especially from past rubber exploitation and current low scale timber extraction and sporadic hunting. The site at the Apayacu River was the most impacted of the three, since members of the downstream communities often visit it for hunting; fishing and other resource extraction. Relative abundance of lowland tapirs was clearly the highest at the Yaguas River, followed by the Ampiyacu and Apayacu rivers, with 2.5, 0.7 and 0.4 tracks/km respectively. At the Yaguas River, also we recorded up to 11 direct observations of tapirs in a two-week period. Low human impact and high lowland tapir abundance at the Yaguas River offer an opportunity for tapir conservation in this part of the Peruvian Amazon.

### **Tapir (*Tapirus terrestris*) Habitat Use Related to Cattle Presence in El Rey National Park, Salta, Argentina**

**Silvia C. Chalukian<sup>1</sup>, Soledad de Bustos<sup>2</sup>, Leonidas Lizárraga<sup>2</sup>, María Saravia<sup>2</sup> &  
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In Argentina's northwestern forests, tapirs find the most extended habitat for their survival, but shared with cattle, roaming free almost over the whole region. Many scientists agree about the negative impact caused by cattle ranching on natural ecosystems, but there are few studies about this topic. In 2002 we initiated a study about cattle impact on tapirs in El Rey National Park, Argentina. With 44,162 hectares, subtropical climate, and seasonal summer rains, the Yungas forests (montane or cloud forest) is the dominant type of vegetation. Our main objectives are: 1) Evaluate the influence of feral cattle on tapir habitat use; 2) Gather basic information about tapir's ecology. We compared habitats and tapir's habitat use along 16 km in 8 similar streams with and without feral cattle permanence. Fecal samples for diet and parasites, and browsed plants were collected. Applying the Neu method ( $\chi^2$  test and Bonferroni Z test), we found



## PAPER SESSION 1 - LOWLAND TAPIR

statistical differences comparing frequency of use and counts of track groups between sites with cattle (less used than expected) and sites without cattle (more used). Few significant differences of vegetation structure among sites were found, and interference could be an important factor. Detailed diet overlap, daily movement and habitat studies should still be performed.

### **Diet of Lowland Tapir (*Tapirus terrestris*) at the Yavari-Miri River, Northeastern Peruvian Amazon**

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Most studies on tapir diet use fecal samples, which cannot be used to determine the composition of browse using macro analysis, and require micro-histological analysis to determine browse species. In the western Amazon, the high diversity of plants makes micro-histological analysis difficult, since the key would need to include thousands of plant species. In this paper we present the composition of browse plants in the lowland tapir diet using a collection of botanical samples from plants browsed along tapir trails. Plants browsed by lowland tapirs were collected from plants eaten along tapir trails in the middle course of the Yavari-Miri River, northeastern Peruvian Amazon, from January to December 2001. Botanical specimens for plant identification were collected and identified at the *Herbarium Amazonense* in Iquitos, Peru. We collected one hundred thirty-four browse samples, which include 89 species from 31 plant families. The most common families of lowland tapir browse were from Melastomataceae, Rubiaceae, Myristicaceae, Euphorbiaceae, Fabaceae and Sapotaceae. Fruit eaten by lowland tapir varied throughout the year, depending on fruit availability. Fruits in the lowland tapir's diet in this region include a number of palm species (mainly *Mauritia flexuosa* and *Oenocarpus bataua*), a Moraceae (*Ficus insipida*), an Anacardiaceae (*Spondias mombin*) and an identified Annonaceae.

### **Anesthetic Protocols Used on *Tapirus terrestris* in Venezuela**

**Pilar Alexander Blanco Márquez<sup>1,2</sup> & Víctor Juan Blanco Márquez<sup>3</sup>**

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The purpose of this paper is to present the experiences related to capture and immobilization protocols for wild and captive tapirs in order to standardize methods that guarantee the security and well being of the animals, as well as the correct utilization of the anesthetics and adequate procedures. The main objectives

## PAPER SESSION 1 - LOWLAND TAPIR

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were to establish a standardization of anesthetic protocols for chemical immobilization of *Tapirus terrestris*, an unification of technical criteria for anesthetic drugs utilization, establishment of a form to register capture and immobilization data, and establishment of an anesthetic administration regime. The standard data collection form allowed us to compare the anesthetic and physiological variances according to the procedure type (capture, translocation, immobilization, surgery, collection of samples etc). The anesthetic drugs were administrated using direct (by syringe) and distance (blowpipe and pistol) injection methods. Immobilized animals were captive, semi-captive and wild. In the last case, we placed baits to attract the animals. The anesthetic protocols that provided the most adequate results with minimal physiologic compromise were: 1.) Ketamine (3.5-4mg/Kg) plus Xylazine (2-2.2mg/Kg) IM, supplemental drug: Ketamine 1.4mg/Kg IM or IV; 2.) Telazol (2.5-2.8mg/Kg), supplemental drug: Ketamine 1.2-1.5mg/Kg IM or IV; 3.) Butorphanol (30-40mg/animal) plus Xylazine (0.5-1 mg/Kg); 4.) Etorphine (1.0-1.2mg/animal). The antagonists were Tolazoline 4mg/Kg (to revert Xylazine) and Diprenorphine 2mg/mg (to revert Etorphine). This results will be very useful to vets and biologists working on tapirs with the goal to establish a global and standardized immobilization, capture, management and Dx examination techniques program.



## PAPER SESSION 2 - MALAYAN TAPIR

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### **Behavioral Ecology of the Malayan tapir, *Tapirus indicus***

#### **Carl Traeholt**

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A research project on the behavioral ecology of Malayan tapirs, *Tapirus indicus* was implemented in August 2002 as a joint venture between Department of Wildlife and National Parks, Malaysia and Copenhagen Zoo, Denmark. The project takes place in Krau Wildlife Reserve that covers 63,000 ha of primarily lowland tropical rainforest. The objective of the project is to capture up to 10 Malayan tapirs and fit them with radio-transmitters in order to study their habitat requirements, home-range size, population density and possibly social behavior. After having tested the use of both pitfalls and darting from high-hides, we have decided to utilize lightweight steel traps that we can assemble and/or dismantle in less than an hour. Due to very low population densities the two first methods are unsuitable for trapping Malayan tapirs in Krau. To date two individuals have been captured which reflects a critically low population density. One female was caught in October, 2002 and monitored for 7 months before losing signal, possibly due to transmitter failure. The female established a home-range spanning more than 25 km<sup>2</sup> and traveled more than 4 km on certain days. A male tapir was caught in October, 2003 but unfortunately we lost signal of this individual, again due to transmitter failure, after only 7 days. By positioning camera traps at salt licks and other places frequently visited by tapirs, we have monitored visit frequencies and time of day. It appears that tapirs visit salt licks much more frequently than other animals and that they do so at relatively constant intervals.

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### **Asian Tapir Management at Mountain View Conservation Center, With Some Notes on the Management of a Female Mountain Tapir**

#### **Douglas M. Richardson, Oscar Long & Gordon Blankstein**

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Since the arrival of the first animals in July 1994, Mountain View Conservation Center has had seven tapirs of two species, *indicus* and *pinchaque*, in the collection; an additional three animals were stillborn. The current population consists of two pairs of *indicus* and a single female *pinchaque*. All the animals are managed in simply designed barns but they have access to very large, by captive standards, outdoor enclosures that can generally be described as rugged, forest terrain. All of our tapirs are conditioned to being stroked and handled to varying degrees. This allows us to carry out routine, simple health checks and, when warranted, conduct simple veterinary procedures without the need for physical or chemical restraint. A total of five *indicus* have been born at Mountain View to two different pairs, 1.1 being reared fully. The adult pairs of *indicus* are housed in adjacent enclosures, which stimulates the males to aggressively defend and mark the common perimeter fence. The effect of this activity on the respective females is unclear. A pair of *pinchaque* arrived in August 2001, but both were in poor physical condition. Prior to the male's death, both animals were managed together and given routine access to a large, but steeply sloped wooded ravine. The temperate rainforest climate of southern British Columbia, coupled with a more challenging environment than the species is normally accustomed to in a captive environment, triggered a rapid improvement in both the health of the two animals and the level of their compatibility with each other. The female remains in excellent health.



## PAPER SESSION 3 - MOUNTAIN TAPIR



### **Food Availability and Use by Mountain tapir (*Tapirus pinchaque*) in the Central Andes of Colombia**

#### **Diego J. Lizcano**

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Diet of Mountain tapir (*Tapirus pinchaque*) and availability of food, were compared to detect main item plants and species that could affect tapir populations by potential plant depletions. Seasonal faecal samples were collected and analyzed by microhistology techniques. Food availability was measured during 12 months in 2002-2003, in terms of biomass and diversity, in 1 m x 1 m plots, along 15 point-quadrant transects of 100m in upper mountain rain forest and Paramo in "Los Nevados" National Park. 129 plant species were identified as available for herbivores and tapir uses 90% of them. In biomass terms, *chusquea* sp. and grasses were the most available plants. Main items in mountain tapir diet were Asteraceae and Melastomataceae family plants, the conservation of which would be essential for the mountain tapir populations. Despite their high dietary diversity, tapirs could be affected especially by shared food use with cow and horses in Paramo habitats. Deforestation to crop potatoes, fires and woody plant extractions for firewood would caused a decrease of shrubby stratum, food diversity and patchiness, and could force an increase of competitive risks, with cattle and native herbivores. Management priorities should be focus to monitor tapir density, discourage a livestock carrying increase and avoid firewood extraction in "Los Nevados" National Park.

### **Action Plan for the Conservation of the Mountain Tapir (*Tapirus pinchaque*) in the Colombian Coffee Growing Region**

#### **Jaime Andres Suárez Mejía**

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This paper will present the strategy for the conservation of the mountain tapir (*Tapirus pinchaque*) in the Colombian coffee growing region. This conservation strategy was developed in consultation with several different institutions and researchers. It is articulated with the National Programme for Tapir Conservation and Recovery In Colombia. The strategy has a main goal, which is to maintain viable populations of mountain tapir in the long-term. It involves an action plan, which comprises 5 main objectives: to promote research, to develop a communication strategy to sensitize people, to develop a securing food program, to experiment several sources of renewable energy for people in the high Andes, and to promote inter-institutional coordination for planed biological corridors and hunting control. The strategy will be materialized in an action plan which starts in 2004 to 2006, specifying value for its development and responsible or participants. This action plan will allow us to initiate specific actions for mountain tapir conservation in the region, which has good potential to succeed in the long term.



## PAPER SESSION 3 - MOUNTAIN TAPIR

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### **Mountain Tapir Conservation Project in the South of the Central Andes of Colombia**

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Habitat fragmentation is probably the biggest problem to solve for the conservation of mountain tapir populations along its distribution range. When habitat fragmentation occurs, wild populations are exposed to external factors like poaching, border effects, accidents etc. Moreover, the isolation of groups of individuals in small "islands" reduces heterocigosity levels and threatens resulting subpopulations. In isolated populations inbreeding can occur, then adaptability can be affected with time, especially when an epidemic disease or a catastrophe comes. In this study we are evaluating the condition of mountain tapir populations as a first step in a long-term strategy to create a biological corridor system for mountain tapir and its associated fauna and flora in the south of Central Andes of Colombia which will connect three national parks. The project is divided in various phases starting with a first one of twelve months in which we are constructing a Geographic Information System based on mountain tapir populations inhabiting the study area (Andean region in Cauca and Valle del Cauca provinces). At the same time we are performing a series of workshops, interviews and surveys with local indigenous and mestizo populations to evaluate human perceptions and attitudes in relation to mountain tapirs. The information gathered in this way will be analyzed and used to construct an environmental education strategy adapted to local reality. In this paper we'll focus on preliminary and expected results for the first phase of the project.

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### **Remnant Habitat for Mountain Tapirs at the Northeastern Andes of Colombia**

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An evaluation of remnant habitat for mountain tapir at northeastern Andes of Colombia under jurisdiction of 4 neighboring regional environmental agencies was conducted in year 2002, as part of a joint wildlife management and conservation project. Although data for the whole eastern cordillera was considered, the study focused on the region located between 3° - 7° N and 72° - 75° W, in an area of over 4 million ha. The extent of current mountain tapir habitat remnants in this area was assessed by examining current land cover and land use of those areas above 2000 m. Importance of remnant habitat fragments was assessed according to size and connectivity, as well as tapir distribution records. The study area currently has 569,076 ha of remnant natural vegetation (cloud forest, high Andean scrubs and paramos), accounting for only 23.5% of original habitat in this region. The remnant habitat is not continuous, but spread in 33 fragments of size ranging from 17 ha to 150,144 ha. The three most important habitat fragments coincide to current protected areas and their neighborhoods. Smaller fragments could be of importance for mountain tapir if conservation actions are taken involving neighboring areas currently under other regional environmental agencies management.

## PAPER SESSION 4 - BAIRD'S TAPIR



### A Correlation Factor to Estimate Baird's Tapir Population Density in the Rainforest

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The purpose of this study was to formulate a Correlation Factor (CF) that could be applied to data from track counts and direct sightings along transects to estimate actual population density for Baird's tapir. The study was conducted with eight free-ranging tapirs in the Sirena Sector Corcovado National Park, Costa Rica. On a monthly basis, we monitored the movements of the tapirs via radiotelemetry during continuous 24-hour periods. We also conducted monthly track counts and direct sightings (diurnal and nocturnal) along 18 transects (500 m) in the study area. We found differences between months ( $F=3,17$ ;  $gl:3,30$ ;  $P=0.046$ ), in the average daily movement patterns of the tapir. An average of 2,32 tracks/km were counted (209 total; 114 in primary forest transects and 95 in secondary forest transects). We found differences between transects in the number of tracks ( $F=4,66$ ;  $gl: 17,179$ ;  $P=0.0001$ ). Only eight direct observations were made, all during nocturnal counts and only in the month of January (6 in secondary forest, 2 in primary forest). We calculated the CF by dividing the actual population density in the study area by the average number of tracks counted. The actual tapir population density (2,866 tapirs/km<sup>2</sup>) was calculated by radiotelemetry using the program Telam88. The resulting CF was 1,234 tapirs/km<sup>2</sup> for every track/km counted. With the results of this study, researchers throughout Central and South America can establish traditional (and inexpensive) track count and sightings studies in their area and apply the CF to obtain a much more reliable assessment of their tapir population.

### Ecology of Baird's Tapir in a Cloud Forest of Southeastern Mexico

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The purpose of this study was to investigate the relative abundance, density, habitat use, impact of ecotourism and coffee plantations, and hunting of Baird's tapir (*Tapirus bairdii*) in Polygon I of the El Triunfo Biosphere Reserve, Chiapas, Mexico. Relative abundance indices and density estimates obtained along 456.9 km of transect lines (0.67 tracks/km; 0.25 tapir feces/km; 0.40 ind./100km, and 0.07 ind./km<sup>2</sup>) were slightly different from those reported in previous studies. Baird's tapir was more abundant and used with greater intensity the Cloud Forest with respect to the other vegetation types ( $P < 0.01$ ). Tapirs also avoided moving



## PAPER SESSION 4 - BAIRD'S TAPIR

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along transects with ecotourism activities ( $P < 0.0001$ ), and very disturbed habitats such as coffee plantations. The analysis of interviews with residents of the study area and staff of the reserve, suggests that occasional tapir hunting persists mainly around the limits of the core area, where a constant transformation of forests into coffee plantations exists. The permanence of Baird's tapir in the study area will not only depend on avoiding further opening of transects for ecotourism, bird watching, and other recreational activities in the protected area, but also on looking for alternative agro-forestry systems which may help to diminish hunting pressure towards this mammal in the buffer zones of the El Triunfo Biosphere Reserve.

## PAPER SESSION 5 - GENERAL TOPICS



### The Influence of Large Herbivores on Neotropical Forests

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The project "Influence of Large Herbivores on Neotropical Forests" is a coordinated research initiative that will be conducted in four field sites in four countries of Latin America: El Rey National Park in Argentina, Morro do Diabo State Park in Brazil, Los Nevados National Park in Colombia, and Corcovado National Park in Costa Rica. This project is an innovative conservation initiative and will investigate the role large herbivores (tapirs, deer and peccaries) play in maintaining and shaping the plant communities of Neotropical forests. Many ecologists have documented the important roles played by large mammals in seed dispersal, seed predation, herbivory, and pollination, but until recently few have considered what would happen if the large mammals were removed from the system. The primary goal of this project is to describe the influence large herbivores exert on the understory plant communities of four different Neotropical ecosystems of Argentina, Brazil, Colombia and Costa Rica. Specifically, the main objective of the study is to examine how the removal of large herbivores will affect the physical structure and floristic diversity of the understory plant communities in primary and secondary forest habitats at each site. In order to simulate the removal of large herbivores from the forests, we will construct exclosures to prevent them from foraging on vegetation in selected areas. Data will be gathered on variables to describe structural and floristic changes in the plant communities over time.

### Conservation of the Baird's and Lowland Tapirs Through *In-situ* Partnerships

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It is recognized that there are many international and national, social, political, and economic circumstances that affect the prospects of conserving biological diversity *in-situ*. The Center for Ecosystem Survival concentrates on *in-situ* strategies and actions, which aid in part to help promote the conservation of the Baird's and Lowland tapir. It is important to note however, that recommendations presented for conservation



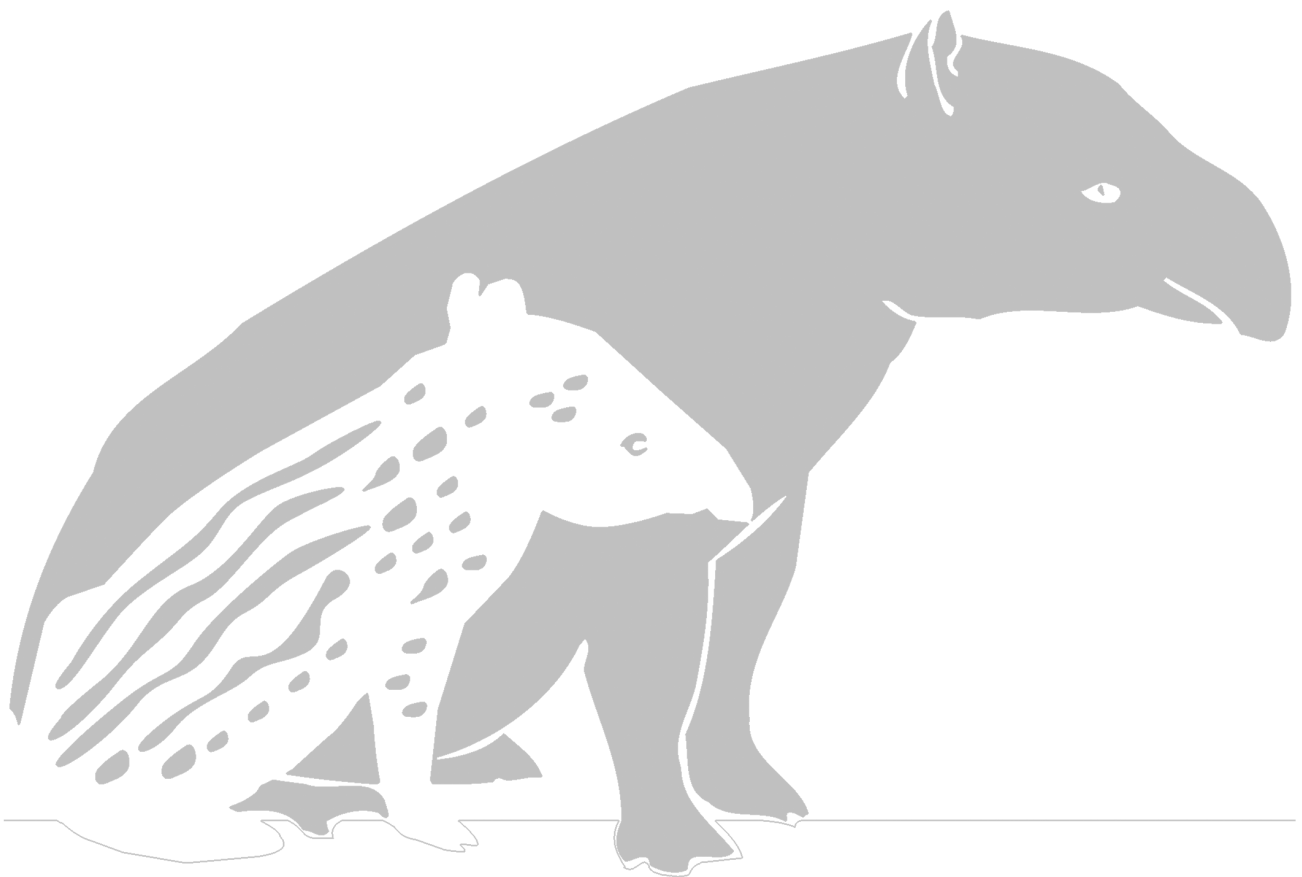
## PAPER SESSION 5 - GENERAL TOPICS

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often emphasize only the case of the individual species. To be fully successful, it is essential that any actions directed to its conservation should complement and enhance initiatives to conserve biological diversity at the ecosystem and landscape level as well as at the species level. In order to increase the chance of survival of tapir populations it is important to link the habitat conservation areas with direct conservation stewardship through partnership. The Center for Ecosystem Survival, in 1988, developed a model *in-situ* conservation program founded to unite zoos, aquariums, natural history museums, botanical gardens and science centers in a concerted conservation alliance to preserve threatened and endangered *in-situ* ecosystems worldwide. Through the combined efforts of the more than 117 zoos, aquariums, and schools, the CES program has raised more than \$2.5 million for field conservation projects throughout Latin America. These include the purchase and/or protection of endangered and threatened habitat in Costa Rica such as the Guanacaste Conservation Area and Corcovado National Park; in Guatemala's Sierra Lacandon region in the Maya Biosphere and in the Pantanal of Brazil. All of which are home to the Baird's or Lowland tapir as well as hundreds of other species of fauna and flora. The goal is for all of our institutions to motivate people to act, and to change patterns of behavior that significantly affect the fate of ecosystem survival. The Center for Ecosystem Survival would like to promote, to the Tapir Specialist Group and to the participants of the International Tapir Symposium, a strategy for zoos, botanical gardens, aquariums, keepers, staff, the visiting public, school aged children, corporations and the private sector to become involved in direct action steps to maximize our efforts to preserve wildlife in wild places.

# **ABSTRACTS**

## **Posters**







## POSTERS - BAIRD'S TAPIR



### **Conserving tapirs (*Tapirus bairdii*) to Conserve "La Amistad" International Park, Costa Rica**

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"La Amistad" International Park (LAIP), in Costa Rica and Panama, is the largest park in Costa Rica with 520,000 acres, and is very important for the regional biodiversity in both countries. The fact of finding tapir populations from 600 meter till 3,600 meters of altitude makes this park a keystone for biodiversity conservation. Nevertheless, due to the size and isolation of the park, along with little financial resources addressed towards its management, it is very hard to know precisely the condition of the ecosystem in the area. Culturally, Bribris and Cabecares indigenous communities formerly had access to those territories, and are currently living in the surroundings of the park. For these tribes, tapirs are considered a close relative and have a deep symbolic and sacred value. In previous times they had important hunting and holly areas for tapirs in the LAIP territories. For this reason, we will study the tapir ecology focusing on their abundance, food habits, home range and key potential areas for their survival in the park. Through this information, we aim to strengthen the management of the park, the consciousness of the dwellers in the area, and their participation in the solution of conservation issues. Conservation International and the Costa Rican Environmental Department (MINAE) fund this study.

### **Habitat Relationships and Population Estimation of Baird's Tapir: A Proposed Investigation**

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Although the current range of Baird's tapir is highly fragmented, the species occupies a wide array of habitat types ranging from low-elevation tropical forests to high-elevation montane cloud forest. Most previous efforts to determine population abundance have been based on track count indices and are available only from low-elevation tropical forests. Furthermore, few quantified data are available regarding key habitat components within each occupied habitat type. We propose to obtain Baird's tapir population density estimates and examine key habitat components in three habitat types along the altitudinal gradient of the La Selva corridor on the Caribbean slope of Braulio Carrillo National Park, Costa Rica. Home range areas will be determined for six to ten tapirs in each of the three habitat types using GPS collars. We will examine key habitat components by comparing browse abundance and quality, dropped fruit abundance, and water availability within known home range areas to random areas. Population density estimates will be generated for each habitat type through mark-resight methods using automated camera systems and will be used to generate a stratified population abundance estimate for the study area. Results from this research will provide insight into specific resources that influence habitat quality for Baird's tapir and establish replicable methodology for estimating tapir populations.



## POSTERS - BAIRD'S TAPIR

### **Tapir's Nutrition in Captivity: The Case of the Simon Bolivar Zoo, Costa Rica**

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Since a few years ago, the Simon Bolivar Zoo's Nutrition Program has been working on the establishment of some parameters to analyze the tapir's nutrition due to the inexistence of enough data about this topic, and due to the fact that it's an endangered specie. The zoo holds two males, "Salom" (8 years old) and "Toto" (5 years old). In the beginning of the nutritional evaluation (1999), their diet was composed of low dry matter food sources, low crude protein and high amounts of non structural carbohydrates. This situation was not suitable for the species, classified as intestinal fermenter, because they need high amounts of fiber. Currently, both individuals have a food intake of 1.5% of body weight in dry matter. This value is used for the main of domestic species. When the diets was formulated, we used the horse's nutritional requirements of N.R.C (U.S.A), with values of crude protein between 10-13%, 3200-3400 kcal/kg of ME, and Calcium values between 0.2 - 0.3%. Also, we are including high fiber sources, minerals and vitamins as a supplements, and high variety of food sources as a part of environment enrichment program. The results have been favorable: good body condition, low incidence of diseases and absence of nutrient deficiencies or toxicities critical symptoms.

### **Relative Abundance, Movements, Habitat Use and Principal Threats of Tapir (*Tapirus bairdii*) in Laguna Lachuá National Park, Guatemala**

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The Danta or Tapir (*Tapirus bairdii*) is the largest wild mammal in Guatemala. The species inhabits non disturbed forests and it is thought to be in danger of extinction mainly because of the loss and fragmentation of its habitat and by excessive human hunting pressure. Although Guatemala, Mexico and Belize comprise approximately 50% of the distribution of these animals, in Guatemala there has been no study that allows a clear view of the state of the populations and other essential ecological aspects for the development of a management plan. The Laguna Lachuá National Park, in the department of Alta Verapaz, Guatemala, is a substantial patch of forest of 14,000 ha that comprises several vegetation associations and harbors abundant creeks and flooded areas that are frequently utilized by tapirs. Thus, it is an ideal area for population studies of this species, since it could become a priority area for their conservation. The investigation is intended to determine the relative abundance, movement patterns, habitat use and principal threats in the region. It will also be utilized like a pilot study that will help to standardize the methodology so replicates of the study could be carried out in other areas with potential importance for the conservation of the species and to determine other priority actions of conservation in order to prevent their extinction.

## POSTERS - BAIRD'S TAPIR



### Predation of *Tapirus bairdii* by *Puma concolor* and *Panthera onca* in two Biosphere Reserves, Chiapas, Mexico

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Few reports exist of predation of tapirs by jaguar or puma. This work documents the presence of these large mammals sharing the same sites in the Sierra Madre de Chiapas, with the goal of learning their feeding habits in El Triunfo y La Sepultura. In El Triunfo during 2001, 680.3 km of transects were traveled, we collected 2 fecal samples of jaguar, and 3 samples of puma. During 2002 in El Triunfo, 417.7 km were traveled, we collected 2 fecal samples of jaguar and 17 of puma. In La Sepultura, 150.75 km were traveled; we collected 18 fecal samples of jaguar and 10 of puma. To separate the components we used the method described in Korschgen (1948) and Chinchilla (1997), modified by Cruz (2001). The scientific collection of mammals at the IHNE was consulted to identify the components. According to the 2001 results, we obtained for the jaguar 14% of tapir in El Triunfo, a relative frequency (FA) of 0.33 and a relative biomass (BER) of 225 Kg. For the puma we obtained 12% of 0.19 (FA) of 1125 Kg (VER). For the jaguar in La Sepultura we obtained 17% and 225 Kg (BER). For the jaguar in 2002 in El Triunfo we obtained 25% (FA) of 0.5 and (BER) of 225 Kg. For the jaguar in La Sepultura we obtained 13% (FA) of 0.11 and (BER) de 450 Kg. For the puma we obtained 6% (FA) of 0.10 and (BER) of 225 Kg. No significant differences were found in the predation by these felids between years and reserves ( $X^2 = 22$ ;  $gl = 2$ ;  $p < 0.05$ ). We found that the tapir appeared in an important manner in the diet of both felids, not as a common prey, however, somewhat as a medium presence.

### Foraging Habits and Diet of *Tapirus bairdii* in the Sierra Madre of Chiapas, Mexico

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In the literature, the Central American tapir is considered a relevant species in the dynamics of tropical forests due to its possible affects through foraging, seed dispersal and predation. The objectives of this study were: (1) determine the foraging habits of the tapir; and (2) learn the diet of this specie in the Biosphere Reserves La Sepultura (REBISE) and El Triunfo (REBITRI). Between February 1998 and December 2002 we conducted counts of tapirs and tapir sign in 3,538.11 km traveled in 23 transects in both reserves. We collected 1,290 fecal samples and 337 samples of plants, fruits and seeds consumed by tapir. The diet of the tapir consisted of 98.6% leaves and stems and 1.4% of fruit ( $n=278$  fecals). Of the plants collected, we identified 61 families, 59 genera and 84 species consumed by tapirs, including 11 new species reported for the tapir in Chiapas.



## POSTERS - BAIRD'S TAPIR

### **Measurements and Physiologic Constants For a Juvenile Female *Tapirus bairdii* Before and During Its Stay in the Regional Zoo Miguel Álvarez del Toro, Tuxtla Gutiérrez, Chiapas, Mexico**

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In April of 2001 the Zoológico Regional Miguel Álvarez del Toro (ZooMAT) received a female tapir (*Tapirus bairdii*) of approximately four months of age from the southern zone of Santa María Chimalapas, Oaxaca. A morphometric study and clinical inspection starting from age four months has provided information about the speed of growth in its first year of life, as well as reference ranges of its heart rate, respiratory rate and temperature. The measurements were taken with a flexible measuring tape, while vital signs were taken with a stethoscope and digital thermometer. The physiological data resulted in the following information: (1) respiratory rate: (21, 18 min.-24 max; n= 18), heart rate (67, 61 min.-71 max.; n= 18) and temperature (36.6, 36.3 min.-36.9 max.; n= 11). For the measurements we obtained a rate of growth of 28.4 mm/month in the body measurements and 7.5 mm/month for the extremities. We observed a faster growth rate during the tapir's stay at ZooMAT, compared to the rate observed in the community.

### **Diet and Food Habits of Baird's Tapir in a Cloud Forest of Southeastern Mexico**

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The diet and food habits of Baird's tapir were studied for 10 months through fecal analysis (N= 97) and direct sightings in Polygon I of El Triunfo Biosphere Reserve, Chiapas, Mexico. The tapir diet was composed of fibers (50.6%), leaves (45.5%), and fruits (3.9%). The proportions of plant parts in the feces differed seasonally and monthly. The proportion of the three components in the feces was similar among transect lines and altitude ranges. Twenty-five species of 27 plant families consumed by Baird's tapir were collected during the study. The most highly represented families were Solanaceae (13%), Rubiaceae (12%), Asteraceae (11%), Poaceae (5%), Cucurbitaceae (5%), Arecaceae (5%), Araliaceae (5%), Araceae (5%), which accounted for 61% of the total plant species. Nine of these plant families constitute new records for the Baird's tapir diet (Actinidiaceae, Begoniaceae, Gesneriaceae, Papaveraceae, Pinaceae, Saurauaceae, Scrophulariaceae, Smilacaceae, and Theaceae).



### **The Role of the Baird's Tapir as Seed Disperser on Barro Colorado Island, Panama**

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Dispersal of seeds by animals is an important component contributing to the spatial organization of plant communities in neotropical forests. Tapirs are among the most effective ungulate seed dispersers. However, their effectiveness varies according to plant species and forest fruit availability. We investigated the seed dispersal role of *Tapirus bairdii* on the protected island of Barro Colorado, Panama. We collected feces opportunistically from four sites over a two month period from late dry season to early rainy season 2003. A total of 64 feces were collected. Feces were dried, and then opened by hand for seed extraction. We identified seeds to the most precise taxon possible. Average seed size was greater for seeds defecated in the early rainy season as compared to the late dry season. Species composition of seeds found within tapir feces changed seasonally and feces consisted mostly of non-fruit plant material. In late dry season, mostly legumes and small seeded herbaceous species were dispersed, while in early wet season we noted the prevalence of *Spondias* seeds. The presence of unidentified palm seed fragments indicates a possible role of *T. bairdii* as seed predator for some species.



## POSTERS - LOWLAND TAPIR

### Assessment of the Level of Parasitism in *Tapirus terrestris* in Morro do Diabo State Park, São Paulo, Brazil

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The characteristics of a given parasite population result from host-parasite interactions and non-biotic habitat conditions. Therefore, parasite incidence or prevalence result from past and present microhabitat changes, local environment, density of host population, and profiles of host species. The purpose of this study is to assess the levels of parasitism in free-ranging lowland tapir populations in Morro do Diabo State Park, Brazil. We analyzed 49 fecal samples collected from May to July, 2003. Three different techniques - flotation, MacMaster and sedimentation - were used for the analysis of the samples. The flotation technique resulted negative for 15 samples, sedimentation resulted negative for 5 samples, and MacMaster resulted negative for 7 samples. All techniques were positive for oocysts of *Eimeria* sp., tapeworm eggs, and larvae of strongylids and strongyloids. The flotation technique was positive for eggs of *Oxyuris* and strongylids. The sedimentation was positive for eggs of strongylids and strongyloids. The number of eggs per gram in the MacMaster technique was 50 at 400 for *Strongylus*. Given that 90% of the samples were positive for one or more parasite species, these results indicate human and domestic livestock pressure, leading to a high density of parasites in the environment.

### Priority Areas for Lowland Tapir Conservation in the Amazon and Orinoco Region, Colombia

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*Tapirus terrestris* is the species of the genus that has the widest distribution range of the three tapir species existing in Colombia. The IUCN lists this species as Vulnerable, due to hunting pressure and habitat fragmentation and degradation. Therefore, the National Program for the Conservation of the Genus *Tapirus* in Colombia was created in 2002. Regarding *T. terrestris*, the program proposes to focus on the definition of distribution areas, evaluation of habitat availability, and definition of areas of different anthropic pressures. Those recommendations were taken into account for this research in the Colombian Amazon and Orinoco region, in order to identify priority areas for the conservation of the species in the region. The localities and distribution data were collected from literature, museum's catalogs and interviews with researchers and local people. Twenty-nine localities from the past and 39 current ones were used. The information was combined with ecosystem and forest areas maps to determine habitat availability. In the same way we defined areas of anthropic pressure, according to hunting areas, indigenous and rural settlements. Finally, we analyzed the information using the GIS ArcView 3.2, to generate the priority areas for the conservation of *Tapirus terrestris*.



### **Classificatory Systems of the Tapir (*Tapirus terrestris*) in Three Ethnic Groups of the Middle Caquetá River: Might There be Subspecies or Local Populations?**

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As part of the project Indigenous Environmental Management in the Middle Caquetá River region, Colombian Amazon, several research projects have been carried out since the early 1990's, focusing on the use and management of wild fauna by local communities. Some of these projects are based on daily records of hunting, taken by the Indigenous hunters. One of the most frequently hunted species is the Tapir (*Tapirus terrestris*). For the Amazonian Indigenous communities, the tapir has a strong symbolic dimension. It is a highly respected species due to its human conception. Tapir populations are seen as "people" with their own social organization, their *malocas* (roundhouses) and a set of rules for their relations with the other beings of the forest. Amazonian communities harbor detailed knowledge about this species' anatomic characteristics, its habitat, distribution, feeding habits, reproductive and behavioral features. Classificatory systems shared by many ethnic groups suggest the existence of five types of tapir, with different characteristics regarding their origin, color, feeding habits, habitat, distribution, taste of the meat and even regarding their behavior when visiting the salt-licks. This information can give clues about the existence of subspecies or at least local populations.

### **Knowledge of the Natural History of the Tapir (*Tapirus terrestris*) by Three Ethnic Groups of the Middle Caquetá River Region, Colombian Amazon**

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Indigenous communities' traditional knowledge of the tapir (*Tapirus terrestris*) is wide and includes detailed information on characteristics of the populations, anatomical and reproductive features (gestation periods, breeding times), social behavior, management regulations and consumption restrictions. Based on daily records of the consumption of this species, together with the recompilation of local knowledge of Andoke, Nonuya and Matapí ethnic groups in the middle and lower Caquetá River, a first approach to the annual cycle of the tapir was elaborated. This approach is built upon traditional ecological calendars that indicate seasonal availability of the fruits eaten by the tapir, seasonal habitat use - dependent on changes of the water level of the river, gestation and breeding times, and restrictions on meat consumption. This study is a contribution to the implementation of a participatory research strategy that allows a detailed monitoring of the species. Such a monitoring is a fundamental tool for the formulation of management plans and conservation strategies.





## POSTERS - LOWLAND TAPIR

### Status of the Lowland Tapir in French Guiana: Hunting Pressure and Threats on Habitats

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French Guiana, a French administrative unit in the Guiana shield, is covered by one of the largest remaining blocks of rainforest. However, until recently the country suffers of a very poor interest for the conservation of natural resources, with a small percentage of forest under strong protection (<3%), limited wildlife management, and no regulation of tapir hunting. Together with demographic expansion, threats on biodiversity are now growing dramatically, with hunting as major threat resulting in fauna depletion in large areas. The harvest was evaluated in 5 catchment areas used by several communities on a 18-month period; it was very close if not beyond the recognized sustainable thresholds in 3 of them. Most of the biomass harvested is devoted to commerce; this highly lucrative activity strongly disorganizes the traditional share of space of the local communities. Although the overall habitat still has a rather favorable status, with a low level of fragmentation, logging activities in the North result of clearing of hundreds kilometers of tracks, providing easy and uncontrolled accesses for hunters to large areas of forest. Also, around 1,000 gold mining sites are widespread all over the country, and increase on a very diffuse and cryptic way to the pressure on the species, and also contribute to the interethnic stress. Our current efforts are (i) at the political and legal level, for recognition of right of use of areas claimed by local communities and revision of the status of the tapir; (ii) at the technical level, for a deeper assessment of the species status and development of GIS applications for a better management of forests dedicated to logging, allowing to design source-sink systems and refuges for the macrofauna.

### *Tapirus terrestris* Presence in Yanachaga Chemillén National Park, Peru

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Between April and May 2003, a preliminary study on *Tapirus terrestris* was conducted in Yanachaga Chemillén National Park (Department of Pasco, Central Forests of Peru), confirming the presence of the species through the identification of several indications in the parallel and adjacent trails to the Rivers Lobo and Pescado and the Quebrada Venado. In addition, interviews with the settlers of the native community Yanesha of the bordering zones were conducted. A total of 36 indications were located between 379 and 656 m of altitude: 6 feeding troughs (16.7%), 1 fecal sample (2.8%), 25 sets of tracks (69.4%), and 4 footpaths (11.1%). Nutritional items corresponded to anthelmintic *Ficus*, *Inga* sp., *Artocarpus* sp., *Calocarpum* sp., *Heliconia bihai* and *Gynierium sagittatum*. Well-known, in all the sites with indications of tapir, also were indications of *Panthera onca*. The tapir is called "ató" by the yaneshas and they said having seen it eating "yuca" (*Manihot esculenta*), *Gaiadendron* sp., *Moutabea* sp., palma (*Mauritia flexuosa*), *Cyphomandra* sp., "kutzú", "ishanca" and "pama" (non-identified species). The tapir hunting in the region is tied to its consumption as a protein source and to the popular perception of some settlers that believe that tapirs are harmful animals that destroy the "yuca" fields. Additionally, the use of some parts of tapir for "magic-curatives" aims was reported.





### Use and Commerce of Individual Parts of the Amazonian Tapir (*Tapirus terrestris*) in Peru

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Between February 2002 and June 2003, 26 markets in the Peruvian Departments of Amazonas, Ancash, Arequipa, Cajamarca, Cuzco, Huánuco, Junín, La Libertad, Lambayeque, Madre de Dios, Pasco, San Martín and Ucayali were visited. Fourteen of these places were illegally selling Amazonian tapir's parts. Most significant sales were recorded in Lambayeque (33.3%), San Martín (19.0%) and Ucayali (14.3%). The products sold were the claws (37.5%, US\$3 to 5.8), leathers (31.3%), skulls (18.8%) and dry meat (12.5%, US\$2/kg). Also, in some markets of Ucayali, the retailers reported the sale of young tapirs as pets. This commerce is local and it is mainly for the use in medicine of some tapir's parts, as much of the people from the city as from the field. From the 120 interviews, 98% indicated to use the nails mainly to cure diverse diseases like epilepsy, asthma, breakage of bones, cardiac problems, faints, hemorrhages and help for pregnant women. Some parts are also used as contraceptives. The meat comprises of the feeding and is well-known as "mounting meat". Skulls and leathers are used like trophies or adornments.

### Captive Management of *Tapirus terrestris* at the Chorros de Milla Park Zoo, Mérida, Venezuela

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"Chorros de Milla" Park Zoo is a Venezuelan governmental institution administered by CORMETUR (the regional tourism corporation). It is located to the Northeast of Mérida city, occupying an area of 12 ha in a small valley crossed by the Milla River to 1,850 m.a.s.l. During the last 50 years, the Milla River presented two exceptional floods that forced the construction of two dikes to mitigate the force of the flow during the rainy season. One of these dikes was used to establish an enclosure of 1,400 m<sup>2</sup> for the lowland tapirs (*Tapirus terrestris*). In 1988, we obtained the first tapir from the Caricuao Park Zoo (Caracas), a juvenile male named "Pijiguao". Since then, we have maintained 5 tapirs in the park (2 males and 3 females) although always a single breeding couple (M, F) at the same time. Between 1990 and 1995, two females brought from Las Delicias Park Zoo (Maracay, Aragua State) died; one due to *anaplasmosis* and the other one drowned during a flood of the river. After this event, modifications were made in the enclosure in order to guarantee the life of the animals. Thanks to the inter-institutional cooperation, in 2000, we received a juvenile female named "Simona", brought from Bararida Park Zoo and Botanical Garden (Barquisimeto, Lara State). "Simona" and "Pijiguao" are currently the breeding tapir pair in the park. In 2002, we achieved the first species breeding event: a male named "Sebastian". The tapir is one of the conservation focal species at the "Chorros de Milla" Park Zoo by means of an integrated program of research, breeding and environmental education.



## POSTERS - LOWLAND TAPIR

### Ethnozoology of Lowland Tapir (*Tapirus terrestris*) in Venezuela

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In order to investigate the relationship between local people and tapirs we are developing personal interviews to gather information about the uses of lowland tapirs and their products (meat, bones, skin etc). The implemented methodology consists in establishing conversation with local hunters and their families living inside tapir habitat. We have prepared color plates with pictures of different wildlife species (mammals and birds) so hunters can point out the species they hunt. Additionally, a literature review is being conducted in order to gather information of other areas of the country. Until October 2003, we have interviewed 40 people in three different places of Venezuela (Aragua, Monagas and Yaracuy States). Tapir hunting and different uses, such as subsistence, medicinal and mythological, have been recorded. By December 2003 we hope to have 100 interviews to develop a final analysis.

### The Karyotype of *Tapirus terrestris* from Venezuela.

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From the four known subspecies of *Tapirus terrestris*, only one, *T. t. terrestris*, has been reported for Venezuela. However, *T. t. colombianus* could be present in the Cuenca del Lago de Maracaibo. In order to characterize these taxonomic entities, we performed a cytogenetic study of *T. t. terrestris* in Venezuela. Blood samples were obtained from 4 males and 3 females from Caricuao, El Pinar and Expan Zoo Zoos. Lymphocyte culture in supplemented medium with fetal bovine serum, penic-strepto and L-glutamine and using concanavalina-A as mitogens. Demecolcine was used to stop cellular division after 72 hours of incubation at 37°C. The results obtained showed that this subspecies has a karyotype  $2n=80$ , with equal number of autosomes arms (FN=80). The first pair of autosomes chromosomes is metacentric while all others are acrocentrics. The X chromosome is metacentric and the Y one is acrocentric. The idiogram shows that all chromosomes are small. Our results are the same as reported by Hsu and Benirschke (1975) and Houck *et al.* (2000). However, unpublished data on *T. terrestris* from the Llanos Orientales de Colombia indicate that the karyotype was a different fundamental number (FN=96), given that 8 pairs of autosomic chromosomes have small arms. Through the analysis of 20 metaphasic cells it was possible to observe in some cells, small arms that were not considered in the measurement procedure which could explain our result of FN= 80.



### **The Tapir, *Tapirus terrestris* (Linnaeus, 1758): A Conservation Education Tool within the Center for the Conservation of Animal Diversity in the Buffer Zone of Turuepano National Park, Venezuela**

**Salvador Boher B.<sup>1</sup>, Mariela Forti<sup>1</sup>, Victor Martínez<sup>1</sup> & Klaus Müller<sup>2</sup>**

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The conservation of the biological diversity of the Orinoco River Delta Region is one of the major priorities of the Center for the Conservation of Animal Diversity. We are initiating a field study to establish the status of the Tapir (*Tapirus terrestris*), which is one of the flagship species of our center. The present study and additional field studies of two endangered species, the Giant River Otter (*Pteronura brasiliensis*) and Manatee (*Trichechus manatus*) carried out at Turuepano National Park and its buffer zone will allow us to improve and strengthen our field education programs for visitors of natural protected areas. Guided tours throughout the conservation center facilities are a great opportunity to observe and interact with tapirs and other wild animals in their natural habitats. This is an excellent alternative to get information on the natural history and ecology of a poorly known mammal and at the same time to keep records of the use of wildlife products by human's populations. This information is urgently needed to formulate and execute management plans for tapir populations in Venezuela. Breeding of tapirs in captivity has been successful in our zoological parks, which is an advantage for carrying out actions to reintroduce tapir populations in protected areas where it has been locally decimated, particularly north of Orinoco and Meta Rivers. The recent creation of the Genealogical Record of Tapir in Venezuela zoological parks will provide the provincial conservation centers with a new tool for the implementation of regional *in-situ* projects for the tapir. Captive specimens play an important role in the *ex-situ* conservation program as it has been demonstrated by a pair of founder breeders (Sacudón, No. 0004; FN: November 27, 1997 and Aurora, No. C013; FN: 1999) of Vuelta Larga. Both specimens were born in captivity and are considered emblematic animals for public education programs in the Delta Region. The research we are conducting has proved that tapir conservation can be accomplished in Venezuela.



## POSTERS - MALAYAN TAPIR

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### Habitat Use by Malayan Tapir (*Tapirus indicus*) in West Sumatra

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This study on habitat used by the Malayan tapir (*Tapirus indicus*) was conducted in Taratak Village, West Sumatra, Indonesia, from September 2003 until recently. Twenty track plots (width 1.5m and length 3m) were set up in four habitat types, primary forest, secondary forest, rubber plantation and riverside forest. Two plots were built on salt lick areas located near secondary forests. All plots were checked every week. Previous studies had shown that Malayan tapir occurs on all habitat types, but the present study resulted in different uses for different habitats. From twenty-two track plots, only one plot in the salt lick area was visited by tapirs. Two visits were recorded in this salt lick. Two sets of tapir tracks were recorded near the plot in secondary forest, but not in the track plot itself. Our tentative conclusion is that secondary forests should be preferred by Malayan tapirs during their activities.

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### Capture Methods of Malayan Tapirs

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In conjunction with a research project on Malayan tapirs, *Tapirus indicus*, various methods have been tested for trapping Malayan tapirs that are subsequently fitted with radio-transmitters. The project was initiated in Krau Wildlife Reserve Malaysia in August 2002. Three methods have been used: pitfalls, cage-traps and dart shooting from a high platform. Four pitfalls and five cage-traps were constructed nearby saltlicks and trails frequently used by tapirs. Darting was attempted from high-hides constructed adjacent to salt-licks. Although we managed to capture a single individual in a pitfall the method is not suitable for capturing Malayan tapirs. The activities necessary to construct a pitfall is very invasive and in 5 full trapping months we only managed to get a single tapir. After the construction of a pitfall there is latency of 11-20 days before a tapir is recorded from the area again and even longer for any animals to return to a capture site after a conspecific has been captured. Subsequently, we tested darting from high-hides but given that the density of Malayan tapirs is very low, visit frequency at congregation points is too long and consequently the cost incurred by mixing expensive drugs that could not be reused was too high. Subsequently, we designed an eighteen piece cage-traps (8 wall pieces, 2 trap-doors, 4 horizontal bars for securing walls, 4 vertical rails for securing trap doors). In order to reduce both weight and cost of the construction traps were made in ½ inch hollow steel bars. They measure 4x1.5x1.8 meters with a weight of approximately 75 kg each. A team of four can assemble/dismantle a trap in less than an hour and consequently they are extremely non-invasive and much more versatile than pitfalls. Cage-traps were baited with fruit and salt. Bait was also put out prior to deploying traps in order to habituate animals to a new scenario.

## POSTERS - MALAYAN TAPIR



### Fitting Radio Transmitter on a Malayan Tapir Without the Use of Anesthetics

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A male Malayan tapir (*Tapirus indicus*) was caught in a cage-trap on 27<sup>th</sup> October 2003. Since there were no veterinarians available with the necessary anesthetics we decided to try to fit a radio-transmitter without anesthetizing it. In order to avoid inducing further stress on the animal the trap was covered with black cotton fabric and the animal was fed extensively with some of its preferred scrubs and leaves. Subsequently, when the animal had become docile and appeared calm, a radio-collar was successfully fitted onto the animal through the bars of the cage. During the whole procedure the animal remained calm and did not show any signs of unease. Subsequently, it was released and monitored 24 hours a day for 5 days. When the cage was opened the animal did not leave it immediately and was still inside the cage the following morning. It is not certain whether or not radio-collars can normally be fitted onto Malayan tapirs that easy or if the docile behavior of the animal was evidence of hyper stress.

### An Investigation of Factors That Potentially Affect Eye Health of the Malayan Tapir - *Tapirus indicus* - In Captivity

**Justine Powell**

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Taronga Zoo in Sydney, Australia, has housed Malayan Tapir (*Tapirus indicus*) since 1996. To date four Malayan tapir have been housed, three from overseas institutions and one calf born at Taronga Zoo. Since arriving in Australia, the Malayan Tapirs have had multiple medical problems including ulceration of oral mucous membranes, skin irritations on their backs, feet problems and eye problems. Eye conditions have ranged from intermittent corneal clouding to corneal ulceration which progressed on three occasions to rupture of the cornea. This paper will discuss the health problems Taronga Zoo has encountered with Malayan Tapir and the steps taken to rectify these problems. In order to assess how common the health problems experienced with this species were, a survey was sent out to forty five zoos worldwide which hold Malayan Tapir. Twenty two out of forty five zoos responded. Of the twenty two respondents, sixteen reported eye problems. This paper will also discuss health problems encountered worldwide in Malayan Tapir, and will indicate that further research in this area is needed.



## POSTERS - MOUNTAIN TAPIR

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### **Clinical and Biological Study of a Dead Mountain Tapir (*Tapirus pinchaque*) in Cali Zoological Park: A Case Report.**

**Delio Orjuela Acosta, Maria Alejandra Arango, Jorge Gardeazabal, Karina Martínez & Lorena Ospina**

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A clinical and biological study was performed at Cali Zoological Park, using a young wild mountain tapir (*Tapirus pinchaque*) dead in Puracé National Park, southwestern Colombia, in April 2003. The animal was found by park officials near a trail showing a wounded rear leg. Although the officials tried to help, the handling of the animal was inadequate and zoo veterinarians that assisted the animal in the final days could not do much to avoid its death after a week of stressful conditions. After the animal's death, the animal was sent to Cali Zoo to be used as a study object. Digestive, reproductive, circulatory and nervous systems were dissected. The skin was mounted to be exhibited in local natural history museums. External and internal parasites were collected and identified. All the information gathered and the experience and knowledge acquired by the zoo veterinarians and biologists will be of vital importance for future management of mountain tapirs in the wild or in captivity in Colombia.

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### **Mountain Tapir (*Tapirus pinchaque*) - Human, Conflict and Priority Areas for Conservation in the Central Andes of Colombia**

**Diego J. Lizcano**

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A series of biogeographical analyses were carried out using a geographic information system (ArcView 3.2 GIS) to determine conflict and priority areas for mountain tapir (*Tapirus pinchaque*) conservation in the Central Andes of Colombia. The Central Andes were analyzed with respect to the representation of several landscape types, tapir's habitat and the existing protected areas network. More specifically, coarse-scale maps of vegetation cover (WWF), transport network (DCW), digital elevation model (USGS), political boundary and municipalities (IGAC), human population density (DANE), protected areas (UASPNN), field data about tapir distribution and five human-caused threats to tapirs, were used in overlay operations to build a model of the difficulty of accessibility for humans to each point and to identify human tapir conflict areas. Two important conflict zones were identified in northern Puracé National Park and southern Los Nevados National Park. An important zone between Las Hermosas and Nevado del Huila National Parks, was identified as a potential conservation area for tapirs. The maps and information derived from this study can be useful for environmental authorities in the establishment of regional systems of protected areas (SIRAPs), to create new protected areas at the regional and municipal levels, or to justify the establishment of corridors between national parks.



### **Potential Conservation Areas and Mountain Tapir (*Tapirus pinchaque*) Conflict Zones in the Colombian Coffee Growing Region**

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We carried out an analysis of critical zones for the mountain tapir (*Tapirus pinchaque*) in the northern region of the species distribution in the central Andes of Colombia, in the coffee growing region, where there is an important population of mountain tapirs. The analysis, using a GIS (ArcView 3.2) as a tool, used several maps from different sources, such as protected areas, forest cover, topographical maps, roads, rivers, types of pressure and population density tables by municipality. We took into account two main criteria. First, an accessibility model, which comprises topographical slope, distance to populated places, roads and rivers, assuming that less accessible zones, where there are tapirs, are potential conservation places. The second criteria was a conflict model, which identifies the kind of pressure by municipality and human population density, in tapir distribution areas. This analysis is a very useful tool to planning tapir habitat restoration, and to design new protected areas in the region. Besides, it can be used as a contribution to the inter-institutional effort to establish a regional protected area system (SIRAP) in the Colombian coffee growing region, which comprises four states where there are four million people.



## POSTERS - GENERAL TOPICS

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### **Promoting Knowledge and Discussion About Tapir Ecology and Conservation in Colombia**

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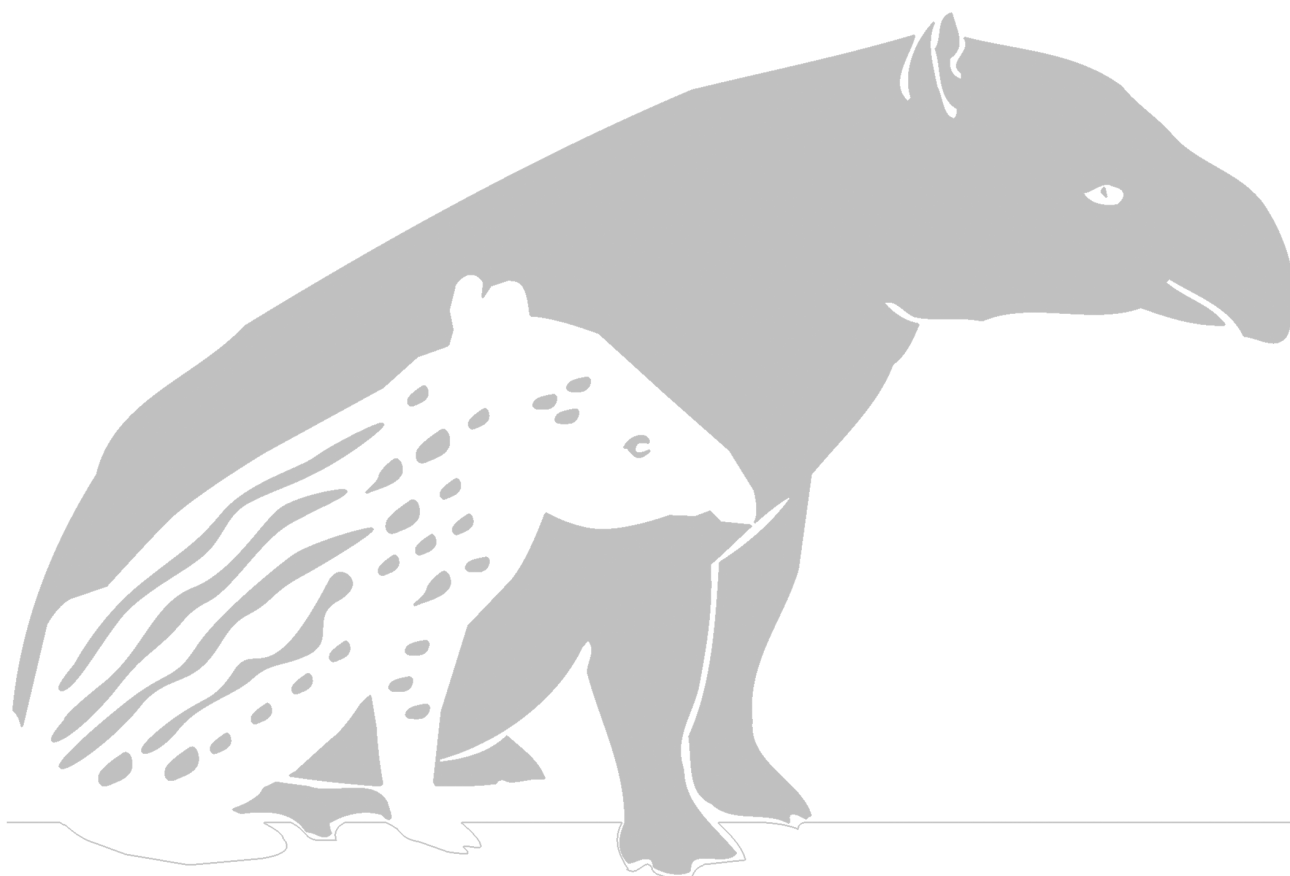
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The Colombian Tapir Network (CTN) was formally created in November 2001 by a small group of eight people (biologists, veterinarians and conservationists) interested in tapir conservation in Colombia, the only place that has all the Neotropical tapir species. After its creation, the CTN has published in their web page, information in Spanish, about tapir distribution, ecology, *ex-situ* and *in-situ* research and conservation projects in Colombia. Its members, currently 39 from different institutions, have been discussing, suggesting and promoting actions and policies for the conservation and recovery of Colombian tapir populations. Many of them, participated in the discussion and compilation of The National Programme for Tapir Conservation and Recovery In Colombia, and have been advising students through an e-mail discussion list. Currently, our immediate goals are to create a national studbook for tapirs, to promote tapir research in zoos, and to help in the implementation of The National Programme for Tapir Conservation and Recovery In Colombia. The network aims to facilitate communication among people and institutions interested in tapir conservation and research in Colombia.



# **Tapir Specialist Group Committees**

## **REPORTS**





# TAPIR SPECIALIST GROUP COMMITTEES

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## The Tapir Specialist Group Zoo Committee

### Siân S. Waters

Coordinator, TSG Zoo Committee  
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The TSG Zoo Committee was initiated during the first Tapir Symposium in 2001. Committee members consisted of representatives from both *in situ* and *ex situ* tapir conservation. A number of goals were assigned to the group - some of which have been or are in the process of being achieved. Recently, however, it has been felt by some members of the committee that some of these goals could perhaps be changed and new ones initiated. Therefore a workshop will be held during the second symposium to better ascertain what the TSG and others want and need from this committee. The presentation will report on the achievements to date of the Zoo Committee and also on the outcome of the workshop to ascertain its future goals.

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## The Tapir Specialist Group Veterinary Committee

### Pilar Alexander Blanco Márquez

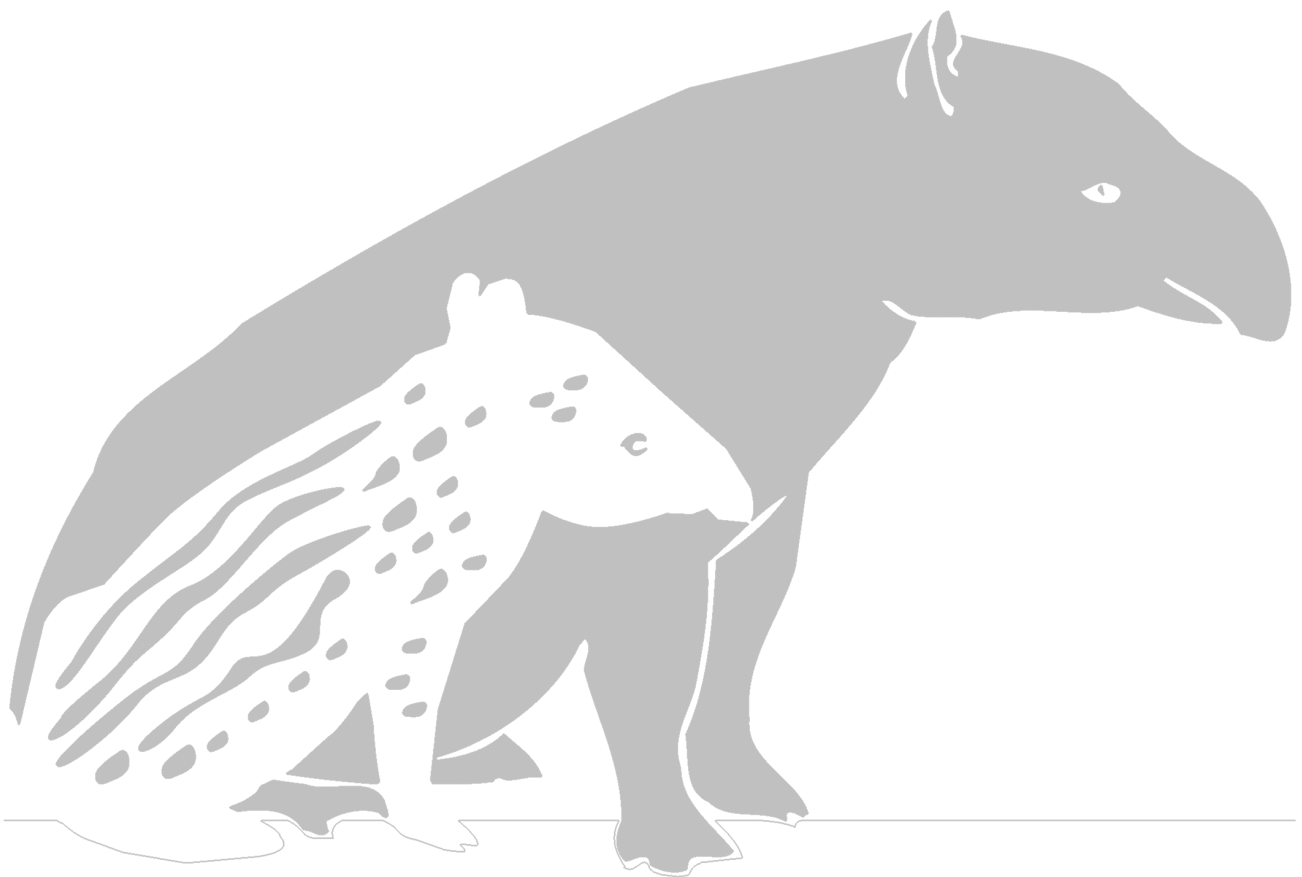
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The IUCN/SSC TSG Veterinary Committee was created during the First International Tapir Symposium held in November 2001 in San José, Costa Rica. The main goal of this committee is to identify the role of the veterinarians in multidisciplinary teams involved in tapir conservation projects. With the participation of a number of veterinarians from Latin America and United States, this committee launched a series of activities, such as the compilation of bibliographic materials based on the experience of each professional working on any of the tapir species. The objective is to put all the information together in order to standardize field methodologies that guarantee that health studies will be effectively conducted and for the benefit of tapir species worldwide. The role of the veterinarian in the conservation of tapirs must be focused on solving the problems of capture and immobilization, as well as investigating the possible problems during the procedures. The role of the veterinarian also includes the diagnosis and identification of infectious and non-infectious diseases that can potentially affect individuals and populations. Additionally, it is also the role of the veterinarian to establish and implement protocols for the collection of biological samples to facilitate the assessment of the health status of the animals. In short, the interaction between the veterinarian and field projects is singular, and the presence of the veterinarian assures the evaluation of all the physiological, metabolic and biomedical parameters directly or indirectly involved with the survival of tapirs.



# **ABSTRACTS**

## **Workshops**





# WORKSHOP 1 - Tapir Genetics



## Tapir Genetics: A Concerted Effort

### Anders Gonçalves da Silva

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The absence of genetic data in tapir literature is conspicuous. Important questions pertaining to the number of species, hybridization and location of hybrid zones, population histories, and structuring of genetic diversity at the continent scale, remain unanswered. The common theme underlying these issues is the fact that they can all be tackled using modern molecular population genetics techniques based on DNA markers. Yet, more importantly, answering these questions would increase our understanding of the evolution of this fantastic group, as well as providing valuable information to focus the conservation effort for these species. Answering these questions usually poses serious difficulties. On one hand, field biologists do not usually have the proper molecular training, or do not have the proper infrastructure readily available for the required analysis. On the other, molecular ecologists do not usually have the field expertise or readily access to samples, especially for studies at such scales. More restrictive still, is the fact that such tasks incur huge financial expenses, and are typically hard to fund. In spite of this, we believe that these questions warrant attention, and should be answered as soon as possible. In this light, we would like to propose a concerted effort to undertake this job, where by field biologists would work in conjunction with molecular ecology labs within Latin and North America. Field biologists would input both samples from the field and invaluable ecological data, while molecular ecologist would process the samples and collect all the molecular data deemed necessary to answer these and other questions. Additionally, funding for cooperation projects of this scale and scope are easier to find than for smaller, more punctual, projects. Finally, once all the data is collected, we propose the realization of a workshop to physically bring together both the field and lab data, and perform a massive effort to answer as many questions as possible. In conclusion, the main objective of this project, aside from obtaining invaluable genetic data, is to establish a network between field biologists and molecular ecologists so that questions of this nature can be answered more quickly and efficiently.



## WORKSHOP 2 - Husbandry and Captive Management

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### **The American Zoo and Aquarium Association (AZA) Tapir Taxon Advisory Group (TAG) Action Plan**

#### **Lewis Greene**

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The AZA Tapir TAG, like other Taxon Advisory Groups, is slowly incorporating more *in situ* initiatives into its long range plans. While the first priority is to breed and maintain tapirs in captivity, these goals are inextricably linked to field conservation programs. This presentation will focus on how the Tapir TAG can become even more effective in supporting international conservation programs through partnerships, public awareness campaigns and fundraising techniques. Citing past programs and future initiatives the authors will propose a framework for the future that will put the "action" back into zoo based Action Plans.

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### **2003 Management Plans for Captive Tapirs in North America**

#### **Alan H. Shoemaker**

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This year the American Zoo and Aquarium Association (AZA) Tapir Taxon Advisory Group (TAG) developed a Regional Collection Plan (RCP) and Husbandry Standards for two species of tapirs maintained by zoos in North America. The RCP has determined that spaces are only present for two of the four species of tapirs, Baird's and Asian tapirs, currently maintained in AZA zoos. Due to space limitations and, in the case of the mountain tapir, severe inbreeding without the likelihood of additional founders from abroad, the AZA Tapir TAG recommends in its RCP that both lowland and mountain tapirs be phased out of AZA zoos through attrition. Target populations for Baird's and lowland tapirs species are set at a minimum of at least 75 individuals for each species. The Tapir TAG has also developed husbandry standards for zoos to use when acquiring captive tapirs. More rigorous than older minimum husbandry guidelines, these standards contain the latest (2003) information on medical, dietary and enclosure needs of tapirs and should be of great use to zoos in all parts of the world that keep tapirs.



## WORKSHOP 2 - Husbandry and Captive Management



### The European Association of Zoos and Aquaria (EAZA) Tapir Taxon Advisory Group (TAG) - A Report

#### Bengt Holst

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The EAZA Tapir TAG had its latest meeting in Leipzig, Germany, in September 2003. Species coordinators gave their annual reports, and management problems as well as research and conservation issues were discussed. Fortunately there is a growing tendency among European zoos to take active part in field projects, and a few of these were presented during the meeting. Furthermore management problems are identified and addressed by the species coordinators, and action is taken. This has resulted in several surveys on f.ex the distribution of TB among tapirs and other similar problems. The EAZA Tapir TAG recommends zoos to get more involved in *in-situ* conservation projects and has given examples of how zoos can benefit from such a co-operation.

### Tapirs and Panama, from a Captive Perspective

#### Rick Barongi

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This presentation will begin with a short history of tapirs (local name, macho de monte) in captivity in Panama. Beginning in 1990, when former General Noriega collected tapirs at his private zoo in La Escondida, the author will recount the significant developments over the past thirteen years that raised the awareness for the conservation of tapirs. Based on the developments and progress to date, the presentation will propose future initiatives to elevate the tapir to flagship status and insure its existence in the wild.

### The New Tapir Exhibit at the Summit Zoo, Panama City

#### Alberto Mendoza

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During the month of January 2003 I had the opportunity to travel to Panama with the organizers of the Tapir Symposium and during this trip; we had a meeting with the mayor of Panama. During this meeting, we informed him about the Second International Tapir Symposium and the tapir exhibit at the Summit Park. In order to ensure the welfare of the 4.3 Baird's tapirs (*Tapirus bairdi*) at the Summit Park, the Mayor



## **WORKSHOP 2 - Husbandry and Captive Management**

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of Panama requested the building a new exhibit. Houston Zoo Director, agreed to coordinate this project and have his staff participate in the construction. This was the beginning of a cooperative partnership between the Houston Zoo and the Municipality of Panama. On April 2003, I returned to Panama with Jim Brighton, an associate from PJA Landscape Architects who specializes in zoo design. Along with Charles Forester, a field biologist from Corcovado National Park in Costa Rica, and the Houston Zoo's maintenance supervisor we set to work. We combined our expertise to design this new exhibit, which, when finished will be the largest tapir exhibit in the world. Two more trips were scheduled in September and December to begin construction. This time, the Houston Zoo maintenance department was involved. The team included a welder, plumber, horticulturist, and supervisor. Most of our maintenance staff speaks Spanish which was a big help in working with the Summit Park staff. Support for the Summit Park project is part of the Houston Zoo's Naturally Wild Conservation Program for the year 2003. It also offers an opportunity for Houston Zoo's non-animal care staff to be directly involved in conservation projects.

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### **Hormonal and Ultrasonography Studies during the Pregnancy of Lowland Tapir**

**Viviana B. Quse, Francisco Eduardo, Gachen Gustavo & Fernandez Jurado Pablo**

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Serum samples were collected monthly as from April 2002 from a 2-year-old female *Tapirus terrestris*. The animal had been previously trained through operant conditioning in order to collaborate in the different medical procedures. Samples were collected to characterize Progesterone and Estrogens patterns during the oestrus cycle. Four months after starting the study, an increase of Progesterone concentrations (2.95ng/ml) was detected, higher than the initial value (0.78ng/ml). The following samples were performed in order to determine if the female was pregnant. It was confirmed in September 2002. The minimum concentrations of Progesterone were 2.67ng/ml during early gestation and the maximum concentrations to date (October 2003) were 22ng/ml ten days before birth. Estrogens concentrations had a minimum value of 14pg/ml early in gestation and a maximum value of 34.6pg/ml previous birth. The first ultrasonography register was conducted through the transrectal method using a transvaginal transducer (5MHz). Fetal images were detected, confirming the initial diagnosis of pregnancy. The following studies were carried out monthly by transabdominal images with a transducer of 5 and 3.5MHz. Fetus viability was registered through heart beat frequency. The tapir's baby, a male, was born on October 19<sup>th</sup>. The body weight was 8.8kg (19.5 pounds).

## WORKSHOP 3 - Action Planning for Tapir Conservation



### National Program for Tapir Recovery and Conservation in Colombia

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All three species of New World tapirs are present in Colombia: Baird's tapir (*Tapirus bairdii*), mountain tapir (*T. pinchaque*) and lowland tapir (*T. terrestris*). Both *T. bairdii* and *T. pinchaque* are endangered and *T. terrestris* is vulnerable, according to the IUCN Red List. In year 2002, a National Program for Tapir Recovery and Conservation in Colombia was designed under a joint effort of the Colombian Ministry of Environment and Institute of Natural Sciences of National University of Colombia. A preliminary assessment of tapir status in Colombia was carried out based on distribution records from a national survey, museum collections, and field data, as well as a general view of current habitat availability, presence/absence of tapirs in current protected areas, and identification of main threats. A working document containing the above information as well as a proposed recovery and conservation program was discussed at a national workshop held on October 2002 at Otún-Quimbaya Flora and Fauna Sanctuary. Regional environmental agencies, national park representatives, research institutes, universities, zoos, non-governmental organizations, national and international researchers attended the workshop and discussed the proposed program for tapir conservation. A revised version of the program for tapir recovery and conservation resulted after incorporating input from the workshop. Implementation of the program is planned through local and regional projects.

### Mexico's National Plan for Tapir Conservation and Recovery

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Mexico's National Committee for Tapir Conservation and Recovery (CTCR) was created in 2001 to develop an action plan for Baird's tapir (*Tapirus bairdii*) in the country. This committee is supported by the Ministry of Environment and Natural Resources (SEMARNAT), and it currently has about 20 active members working on different aspects of tapir biology and conservation. The action plan contains a compilation of the available information on the natural history, ecology, and management of this species in Mexico, as well as a description of the actions needed to improve the status of local tapir populations. Specific actions



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include: 1) protection and management of remaining habitat through the improvement of productivity and economic incentives in surrounding agricultural areas, 2) creation and maintenance of corridors between extensive forest fragments containing tapir populations, 3) promotion of hunting regulation, ecotourism, and environmental education programs in communities adjacent to areas where tapir populations exist, 4) development of research projects on the distribution, abundance, health, genetic viability, and impact of human activities on tapir populations, 5) encouragement of captive breeding programs for education and research, and 6) personnel training and improvement of access to scientific information.

### Managing the Human Animal: CBSG's Population and Habitat Viability Assessment (PHVA) Workshop Process for Species Action Planning

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Managing an endangered species is an extremely complex conservation problem. It requires a coalescence of expertise from different professions and sectors, an exchange of knowledge and technology, a building of consensus around threats and solutions, and a mobilization of resources. The CBSG PHVA workshop process balances the need to integrate information necessary for evaluating alternative species conservation strategies with the need to integrate, or at least connect, individuals from different disciplines and backgrounds that are centrally concerned with the species of interest. This is done with the hope that some realignment of priorities among individual stakeholder groups will result to take into account the needs, views and initiatives of other groups. Central to this process is the use of *VORTEX*, a simulation model of wildlife population dynamics that provides a tangible focus for quantitative evaluation of conservation options for a species and a vehicle for integrating diverse species biological and human sociological data. Of course, as the diversity of both information and stakeholders increases, so does the challenges of facilitating effective integration. However, CBSG has gone further than any other conservation organization in forging collaborations at multiple levels and at building understanding of the processes required to facilitate such collaborations.

### Malay Tapir Workshop in Malaysia

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A Malay Tapir Workshop was held in Krau Wildlife Reserve outside Kuala Lumpur from 12 to 16 August 2003. The purpose of the workshop was to gather existing data about Malay Tapir distribution and threats in all its range countries in order to be able to develop a conservation strategy for the species based on hard core data instead of gut feelings. The workshop was organized by The IUCN/SSC Tapir Specialist

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Group together with the European Association of Zoos and Aquaria (EAZA) Tapir Taxon Advisory Group (TAG) and the Department of Wildlife and National Parks (DWNP), Malaysia, and 35 participants from 7 different countries attended the workshop. In order to secure an organized approach to the problem and a realistic conservation plan as the output the workshop was organized using a Population and Habitat Viability Assessment (PHVA) format, and two facilitators from the IUCN/SSC Conservation Breeding Specialist Group (CBSG) were invited to run the workshop. The workshop participants were divided into four groups each looking into a specific topic concerning Malay Tapir Conservation and analyzed that specific part. Integration of the different approaches was achieved through regular plenary sessions where data and analyses were presented and discussed. One of the groups did a specific modeling using the VORTEX simulation program. Data from the other groups were entered into the program, and simulations were conducted in order to identify the relative impact of different factors on Malay Tapir conservation. The results from the workshop will be published in a workshop report and will provide the basis for an official TSG Malay Tapir Conservation Action Plan.



## WORKSHOP 4 - Fundraising

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### Practical Ideas and Useful Tips to Raise Funds for Tapir Conservation Projects

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Most researchers spend a good part of their time and energy working to raise funds for their conservation projects and activities. Fundraising is not an easy job and requires skills, and most importantly, patience and perseverance. Our main goal is to provide the audience with practical ideas and useful tips to raise funds for tapir conservation projects. We will be discussing the different types of fundraising and the different types of donors, how to write successful proposals, what steps your organization needs to take before approaching donors, how to conduct research in order to find the most receptive donors, and how to cultivate your donors. Beginning and experienced fundraisers will benefit from this workshop to help prepare themselves and their organizations to seek grants.

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### Web Design as Conservation: Marketing and Fundraising Strategies for the New TSG Website and Conservation Fund

#### Gilia Angell

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The World Wide Web can be compared to the research and conservation movements in the world in that both are vast, with countless problems to solve, and both harness emerging technologies to aid in their evolution. Whether the task is to sell books or save habitat and endangered animals, Web design and conservation rely on human creativity, usability, and communication to succeed. 1.) Definition of usability in context of Web Design. 2.) Analogy of speed comparing the relative speed news takes to travel in the information age. 3.) Adaptation to changing environments. Sociology, psychology and principles of design contribute to a successful website, or research project, by maintaining a human connection to a capitalistic or scientific enterprise. Case Studies: What works and what doesn't; designing a website to meet the needs of those working in the field and those ready to give. Use Cases: 1.) Online retailer Amazon.com; 2.) Websites from high profile NGOs; 3.) Other non-profit organizations TBD. The TSG Website: A walk through a prototype of the new TSG website demonstrating how usability, design and marketing principles used in the retail world can be applied to the nonprofit, and ultimately to the scientists themselves, in their quest to fund their projects. Concluding remarks will include a discussion of emerging technologies and what this could look like in 20 years.