



Tapir Conservation

The Newsletter of the IUCN/SSC Tapir Specialist Group

Number 8, December 1998

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Co-Editor:

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The views in Tapir Conservation do not necessarily reflect those of the IUCN nor the entire IUCN/SSC Tapir Specialist Group (TSG). The objective of Tapir Conservation is to offer the members of the IUCN/SSC Tapir Specialist Group and others concerned with the family Tapiridae, news briefs, opinions, and general information about this threatened mammalian genus. Anyone wishing to contribute to Tapir Conservation, please send materials to:

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From the Chair

As 1998 comes to a close we can look back at a progressive year for the TSG. Our new Group is in place, with each region where our four species exist well-represented. Expertise from the United States enhances the TSG, and both Sheryl Todd and I look forward to continual communications with everyone.

The Tapir Action Plan, thanks to Deputy Chair Sheryl Todd, was the first AP to go on-line, and served as a model for this important communication link at the IUCN Digital Library Workshop in Chicago. The AP can be accessed via the web: <http://www.tapirback.com/tapirgal/iucn-ssc/action97/>

As you read this newsletter, you will note the gaps which still exist in our data files from certain areas. Hopefully, 1999 will be the year we gain more data from the field which will assist in tapir conservation efforts. Interesting news is surfacing about tapirs - an issue suggesting that these animals may be more "pair oriented" rather than solitary in nature. And continuing radio-telemetry work taking place both in Costa Rica with Charles and Sonia Foerster's work, and in Brazil with Patricia Medici's work will no doubt add to our knowledge about the natural history of *T. bairdii* and *T. terrestris*.

An important objective is communication. To all TSG members, keep us informed about your activities and work involving tapirs. We remain a strong and effective Group through the sharing of ideas and information.

Action Plan

Tapirs - Status Survey and Conservation Action Plan is available in paperback and on the web. For an online copy, see "From the Chair." Paper copies can be ordered from:

IUCN Publication Services Unit
219c Huntingdon Road
Cambridge, CB3 0DL,
United Kingdom
Phone: ++44/1223/277894
Fax: ++44/1223/277175
E-mail: iucn-psu@wcmc.org.uk

Island Press
Box 7
Covelo, California 95428
Phone: 800-828-1302 or
+1-707-983-6432
Fax: +1-707-983-6414
E-mail: ipress@igc.apc.org

Hundreds of copies have been distributed throughout the world, and conservation projects are already being planned using guidelines from the book, which has the distinction of being the first non-children's book devoted to tapirs.

We would like to thank Kevin Burkhill of Birmingham, England, for the drawing used above. Kevin is an artist who promotes tapir conservation.

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Fund for injured tapir keeper

As we go to press in mid-December, Lisa Morehead, the Oklahoma City Zoo keeper who was critically injured by a female Malayan tapir on 20 November 1998, is still in the hospital. Her injuries were extensive, including the loss of her left arm, broken ribs, 25-30 major lacerations, two punctured lungs and a seriously damaged larynx. Although she is recovering well and her spirits are good, at press time there is concern about infection. We thank the many who have sent cards and contributed to the Lisa Morehead Recovery Fund. To contribute or send cards and letters, contact Sheryl Todd at the Tapir Preservation Fund (see masthead or web page: www.tapirback.com/tapirgal/lisa.htm). \$100 has been contributed by the Tapir Specialist Group. Donations are tax deductible; the fund's current total is \$850.00.

Tapir Specialist Group

Past and present . . .

We now have thirty-five members in twelve countries: Argentina, Belize, Brasil, Colombia, Guyana, Honduras, Indonesia, Malaysia, México, Thailand, USA, and Venezuela. For members' contact information, please see the back page of this newsletter.

The Tapir Specialist Group was started in the 1980s with Keith Williams as Chair. In 1990, Sharon Matola, Director of the Belize Zoo, was invited by IUCN to assume the duties of Chair. She began TSG's newsletter, *Tapir Conservation*, in September 1990 and in 1991 began making regular submissions to *Species*, the newsletter of the IUCN Species Survival Commission. She pulled together a group of interested people and assigned an editor for the Action Plan (*Tapirs: Status, Survey and Conservation Action Plan*), which went to press in 1997 and became available in 1998. In 1997, Sharon invited Sheryl Todd to become Co-Editor of the newsletter and Deputy Chair of the group. Communications have been aided greatly by the Internet since 1997, and correspondence with the many countries on three continents in which tapirs live has magnified exponentially. The Tapir Specialist Group now has its own web site.

In spring of 1998, we sent questionnaires to selected tapir specialists around the world asking for their thoughts on tapir conservation and ways in which TSG could become a more effective agent. Based on responses, we increased membership from fourteen to thirty-five, adding eight tapir range states to the roster of countries in which members live.

In 1998, our tapir Action Plan was the first IUCN/SSC Action Plan to go online with full text (English version only to date; Spanish and Portuguese to come soon). The Tapir Specialist

Group has been in the forefront of using the Internet for dissemination of information about our species. High visibility on the web has resulted in a tremendous influx of tapir information with which we work each day, and has created the network which led to our increased membership of dynamic field researchers and conservationists.

The Species Survival Commission, of which the Tapir Specialist Group is a part, has recently grown to include over 7,000 volunteers in 110 Specialist Groups. The SSC itself "is one of six volunteer Commissions within IUCN. IUCN is a union of 74 sovereign states, 105 government agencies, 640 non-governmental organizations and 32 affiliates. Collectively the IUCN membership has great influence on the state of the environment throughout the world. Thus SSC has an immediate and established mechanism for distributing information about the critical conservation needs of species to those best positioned to act on that information."*

This year IUCN celebrates fifty years as a leading entity in world conservation. As members of this prestigious body, we as individuals are granted the benefit of backing up our own names and titles with one that carries with it half a century of dignity and influence. As members of the IUCN/SSC Tapir Specialist Group, we each have the opportunity and responsibility to support the parent organization with our unique contributions.

* 1996. "Species Survival Commission: IUCN - The World Conservation Union."

Future . . .

In 1997 we expanded our newsletter format. In 1999, we will begin to publish on a regular semiannual schedule, with issues produced in March and September. We hope that our expanded membership as well as the proliferation of e-mail correspondence will help us fill in gaps in our awareness of tapir conservation projects worldwide. Equally important is recognizing areas in which work has

yet to be started.

To date, much of the function of the Tapir Specialist Group has been to support tapir conservationists and researchers through exchange of ideas, information and literature. In 1999, we will begin to identify areas in which we can work as a group, and to raise money through the Tapir Preservation Fund (a U.S.-based nonprofit organization) to carry out TSG activities.

TSG web site

This year, the Tapir Specialist Group got its own web site (<http://www.tapirback.com/tapirgal/iucn-ssc/tsg/>). It is housed on The Tapir Gallery, web site of the Tapir Preservation Fund. The TSG site is a site unto itself and is designed to coordinate with the IUCN site. You can link to both the IUCN and SSC sites from the TSG site. In addition, links from our main page take you to our newsletters (1997 is up, and 1998 will soon follow; back issues will be posted as time permits). The English language version of our Action Plan is online (full text) and was the first IUCN Action Plan to go online with full text. Our thanks to Andrew Mercer of New Zealand for helping with this task. We were preceded online by an AP produced by the Australian government, and there are several other IUCN Action Plans now available on the web. The Spanish version of the tapir AP is expected to go online by the end of December or early in January. The English and Spanish versions will become part of a demo that will be used to test and promote the idea of a Digital Library for the IUCN, beginning with selected SSC documents and then including the rest of the SSC library. Ultimately, this ambitious and innovative project is intended to include the whole of the IUCN library. It will be a multiple-part project spanning several years. Sheryl Todd attended a planning meeting in Chicago in October hosted by the Brookfield Zoo.

Also on the TSG web site you'll

find a list of current members with contact information and links to e-mail. We update this page regularly, so please keep us informed of any changes.

Our site also links to the most complete tapir bibliography "in print." This project was spearheaded by Donald L. Janssen, D.V.M., of the San Diego Zoo (credits are available on the web page). The printed version and database were turned over to the Tapir Preservation Fund. We have added a number of citations to bring the total to 555, with about 150 still to add. Due to the cost of printing, general accessibility of the web and dynamic nature of a bibliography, we do not expect to print another edition. If researchers are unable to access the web, a printed copy can be mailed. It prints out to about 50 pages; please send \$5.00 for printing and postage to Tapir Preservation Fund, P.O. Box 1432, Palisade, CO 81526 USA.

The next link on our site goes to the Tapir Talk e-mail list sign-up and archives. There is also a search feature which allows searching of both the TSG site and The Tapir Gallery. We receive an average of about 20 visitors per week on the TSG's main page. The Action Plan has had about 300 visitors.

We're very happy with the site and what it has to offer. Please remember that it is OUR GROUP'S site - suggestions and volunteer help are always welcome.

Notices

Request for serum and liver samples from tapirs

We are requesting banked or opportunistically-collected serum and post-mortem liver samples from captive and free-ranging tapirs of any species. We are attempting to document the extent of copper deficiency in captive and free-living tapirs. Samples that we receive will be batched and sent for analysis of Cu, Zn, Fe, and other minerals. In a preliminary study using banked serum

(n=22) and liver samples (n=3) from tapirs, we have found extremely low copper levels compared to reference values from domestic animals. Copper deficiency in domestic animals causes a range of clinical signs including coat changes, unthriftiness, diarrhea, lameness, anemia, fractures, low fertility, decreased immune function, and neurologic disease. This study will determine the extent of copper deficiency in tapirs and to what extent husbandry and disease occurrence is associated with a deficiency. Significant findings about copper metabolism in tapirs will help improve the health of the captive population.

Federal express account number available on request. Thank you for considering this request. Please send 10 ml of serum or 100 g of liver (frozen at -10 to -20 degrees C) to:

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Tapirs may be getting their due in film

This is beginning to look like a pivotal year for public awareness of tapirs through video and film. Several segments on tapirs have aired on international television over the past two years. This year, mountain tapirs were filmed by a Korean company, the results being shown at a nature film festival in Japan in 1998 (see Craig Downer's report under Ecuador). We understand that several other filmmakers are developing segments for television. Until now, tapirs have typically rated a few minutes at best in nature films - long enough to (with luck) whet the viewer's appetite, but not much more. This appears to be changing. We hope that in 1999 tapirs will be presented to the public in film segments both long enough and informative enough to enrich viewers' knowledge of these remarkable

animals and encourage concern about their conservation.

Donations to Baird's tapir project

In May, the Audubon Institute chapter of AAZK (New Orleans) hosted Charles and Sonia Foerster as they returned to Costa Rica. The Foersterns gave a presentation on their Baird's tapir project and the AAZK chapter donated \$500.00. This gift was later matched by the Audubon Institute.

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Correction

In our last issue, we attribute to Craig C. Downer the photo of the swimming tapir on page 14. We offer apologies to the photographer, Armando X. Castellanos of Ecuador.

A tribute to Dr. Miguel Alvarez del Toro

Part 1: "The Best Little Zoo in the World"

by Sharon Matola

When The Belize Zoo first began, I was fortunate to read an article written by Russell Mittermeier entitled, "The Best Little Zoo in the World." The article discussed a zoo in Chiapas, Mexico, started by a man named Miguel Alvarez del Toro. It exhibited species native just to the region, the animals living in well-vegetated, roomy exhibits. Miguel del Toro saw the zoo as a critical link to raising awareness about the local fauna, much of it endangered. Russ Mittermeier also noted that the environmental education messages conveyed by the

zoo were strong, and undoubtedly had a positive impact upon the local community. As The Belize Zoo developed, it became part of our plan to relocate the zoo and build a new facility. I was impressed by everything I'd read or heard about the work of Miguel del Toro. Unable to visit the Tuxtla Gutierrez Zoo myself at that time, I sent two Belize Zoo personnel to Chiapas. They returned excited and inspired. The concept of keeping animals in well-vegetated exhibits by using electric wire was a design idea we immediately adopted. We found that we had common bonds: Both of our zoos exhibited local animals only, we insisted that the enclosures be ample and full of native flora, and we believed strongly in the objectives of aggressive environmental education.

The Belize Zoo formed a large part of its personality from the influence of the Tuxtla Gutierrez Zoo in Chiapas, Mexico. A great day it was for me, in 1995, when I finally did have the opportunity to visit the Tuxtla Zoo, and after a long hug, thank Miguel del Toro for his vision. His work and philosophy not only made a difference in Chiapas, Mexico, but spread throughout the region, affecting our natural resources, and the people who are stewards of these resources, in a most positive way.

Part 2: Baird's tapir bred first at Tuxtla Gutierrez Zoo

by Sheryl Todd

On 15 March 1960, the birth of a Baird's tapir at Dr. Miguel Alvarez del Toro's Tuxtla Gutierrez Zoo in Chiapas, Mexico, marked the beginning of the zoo's historic breeding program. It was the first recorded birth of a Baird's tapir in captivity. The learning curve would be steep; this youngster was killed by a parent at the age of one month.

As early as 1871, tapirs designated as Baird's tapirs had been kept by zoos in England and the United States. In the early days, mistakes were made in distinguishing species of American

tapirs. However, capture locations were sometimes given, and we can probably assume that some of these animals were genuine *Tapirus bairdii*. In a few cases, the tapirs were kept in pairs. Others were kept singly. Many died shortly after importation, but a few lived reasonable life-spans. None of them bred with other Baird's tapirs.

In the 1950s, at least two female Baird's tapirs at different U.S. zoos were bred to male lowland tapirs. In one case, disposition of the offspring is unknown; in the better-documented case, the offspring produced young when bred with a lowland tapir. Still, no captive birth of a full-blooded Baird's tapir was recorded until 1960 at the Tuxtla Gutierrez Zoo.

The zoo had acquired its first Baird's tapir in February 1954, when a male, about six months old, was found in Chiapas, having been badly mauled by a jaguar. A female, also from Chiapas, was procured in March 1955 at the age of one or two months. It was from this pair that the first offspring was born on 15 March 1960. As noted, the first baby was killed. A second was born 20 May 1962. A third - a partial albino male - was born 23 August 1964. As yet, the zoo staff had not actually witnessed copulation. Observation first occurred in 1965. At the time, so little was known of Baird's tapir biology, that even the gestation period was something of a mystery.

By 1966, the zoo had developed a routine to protect the offspring from the male parent. The pair was kept together until just before the birth. They were then separated until the baby was weaned at about one year. The pair would usually mate almost immediately when reunited.

In 1969, Dennis Levy, a British military officer with a longstanding interest in tapirs, reported seeing 2.4 tapirs at Tuxtla Gutierrez, one of the females being just a few weeks old. He wrote, "These animals were said to be the original pair and their 4 offspring, a 5th baby having been killed by the father. Some of them have more white on the face than one usually sees, and the younger male has more or less one-third of his face white."

In July 1970, Dr. Miguel Alvarez

del Toro responded to survey questions sent by the Tapir Research Institute of Claremont, California. He reported that only one death had occurred in an adult Baird's tapir in the zoo's collection. It was caused by accidental eating of a piece of wire, which pierced the tapir's intestine. He listed births as 3.4, of which 1.3 had been reared - all by the mother. Of the juvenile deaths, the two males were listed as killed by the father, while the female infant had been crushed by the mother.

Tapirs were kept in pairs in enclosures that measured 40 x 40 m and were well-planted with trees. Each had a pool 6 x 4 m and 1 m deep; artificial caves were used for housing. Feed consisted of grains, fruits and a variety of local plants known to be eaten by tapirs in the wild. No other species shared the enclosures. The earliest age the tapirs at Tuxtla Gutierrez were known to mate was about 4 years, and all copulation observed had taken place on land. Health problems had been rare, with only two conditions mentioned: rectal prolapsus ("not serious") shortly before giving birth on two occasions; and fever.

Within a year or so after the 1970 survey response, an encephalomyelitis epizootic swept the state of Chiapas. At that time, Tuxtla Gutierrez had seven tapirs, only two of which survived the disease (see *Tapir Conservation*, Number 7, p 3). It is unknown to me whether the survivors were the original pair, although the surviving female was already pregnant at the time of the epizootic. Six months afterward, she had a stillbirth. The male appeared to be impotent for some time, but both recovered and a healthy infant was born on 20 January 1973. On February 4, the male mounted the female again. The zoo had changed its protocol, leaving both parents with the new baby. On 24 July, Dr. Alvarez del Toro wrote, "So far they raised the young who is at present well grown." He went on to say that the older male would soon begin to persecute the young one. As a general note on Baird's tapir temperament, he wrote: "Our experience is that lone males

usually turn mean, probably all, the females not so. Sometimes the males are mean [from a very young age]. We had a male that was vicious since two months old, biting the legs of the keepers."

The Tuxtla Gutierrez Zoo continued to report their census to the *International Zoo Yearbook*, but due to discrepancies in the figures published, it is not clear exactly how the number of tapirs at the zoo increased or decreased after 1973. It appears that, while they continued to breed, the population never again reached more than four. The number appears to have dropped again in the 1980s, and in the early 1990s a wild-born male was captured and transferred to the zoo according to the *International Studbook*.

Ten years and nine months after the first tapir was born at the Tuxtla Gutierrez Zoo, the United States had its first birth of a non-hybrid Baird's tapir. The Los Angeles and San Diego Zoos had acquired a pair each between 1965 and 1967. All were wild born. The pair at the Los Angeles Zoo gave birth to a stillborn female on 31 December 1970. In 1973 another was stillborn, but on 19 February 1974, the pair produced a healthy male. By that time, San Diego Zoo's pair had already produced a healthy male on 14 November 1972. Both pair of founders (plus a second wild-caught female soon paired with the male at San Diego) continued breeding, to giving us many of the first captive-born generation of Baird's tapirs in the U.S.

SOURCES:

Letters: Dr. Miguel Alvarez del Toro, Director, Parque Zoológico de Tuxtla Gutierrez, Chiapas, Mexico.

International Zoo Yearbook, numerous issues, esp. Vol 6, 1966, article by Dr. Miguel Alvarez del Toro: "A Note on the Breeding of Baird's Tapir, *Tapirus bairdi*, at Tuxtla Gutierrez Zoo, pp 196-197.

Letter to from Dennis R.H. Levy to the Tapir Research Institute, 24 June 1973.

International Studbook for Central American Tapir, 31.XII.94, published by Michael J. Crotty, Los Angeles Zoo.

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Janssen, D., R.A. Rideout, and M.S. Edwards. Tapir Medicine. In: Fowler. M.E. and R.E. Miller. *Zoo and Wild Animal Medicine: Current Therapy 4*. W.B. Saunders Co. Philadelphia, USA. 1999. Pp. 562-568.

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Naranjo, Eduardo. J. and E. Cruz. Ecología del tapir (*Tapirus bairdi*) en la Reserva de la Biosfera La Sepultura, Chiapas, México. *Acta Zoológica Mexicana*. 1998; (73):111-125.

Seitz, Stefan. Tapire im Zoo - Bemerkungen zu Aktivitaeten, Sozialverhalten und interspezifischen Kontakten. [Tapirs in Zoos - remarks on activities, social behavior and interspecific interactions]. *Der Zoologische Garten N.F.* 1998; 68(1):17-38.

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TPF activities

The Tapir Preservation Fund was founded in 1996 in Palisade, Colorado, USA, and was granted 501 (c) (3) charitable status in May 1998. Some of our activities this year have included:

- Representing the IUCN Tapir Specialist Group at an international conference on information technology in conservation.
- Consulting on tapir biology, ecology etc., for: The National Zoo in Washington, D.C.; Charlestown Library, NSW, Australia; Digital Frog International, Inc.
- Providing a resource link from Encyclopedia Britannica Online

(<http://www.eb.com>)

- Producing the TPF News and the Club Tapir flyer monthly.
- Receiving grants from the Pittsburgh Zoo, the Columbus Zoo, and several private donors.
- Applying for grants to support tapir conservation projects and for our own operating expenses.
- Raising over \$2000.00 in eight months through Club Tapir for tapir conservation.
- Helping to support Rubén Nuñez,

Director for the TPF in Ecuador. Nuñez gives approximately 20 conservation lectures a month, which reach between 12,000 and 24,000 people annually. He has also helped start a network of Ecology Clubs that now total 40 branches made up of students and young professionals.

- Maintaining an online tapir gift shop.
- Expanding and maintaining The Tapir Gallery. Between August 2 and October 10, our opening page was

viewed 2021 times. For many visitors, this is their first comprehensive introduction to the four endangered tapir species.

- Corresponding with several dozen countries on many aspects of tapirs, their biology and conservation.
- Maintaining several e-mail lists - a discussion list for professionals, an update list for the web site, an information list for the IUCN Tapir Specialist Group and a new Tapir Volunteer Network list.

FROM THE FIELD

All countries in which tapirs are known or presumed to exist are listed. The arrangement is generally north-to-south beginning with the Americas and continuing to Asia. Countries are listed whether or not current reports are available. Populations (given per country) are rough; much more research is needed. Reports are welcomed by the editors.

IUCN Categories, 1998:

- Mountain tapir (*Tapirus pinchaque*):
Endangered (EN)
Malayan tapir (*Tapirus indicus*):
Vulnerable (VU)
Baird's tapir (*Tapirus bairdii*):
Vulnerable (VU)
Lowland tapir (*Tapirus terrestris*):
Lower Risk (LR) - near threatened

How social are tapirs?

The following is excerpted from an article by Sheryl Todd and Sharon Matola published in Species (Number 30, June 1998, pp. 60-61). One or two minor correction have been made here; they do not change the tapir facts in the article.

We have always thought of the tapir as solitary except for mother-calf situations and brief courtships. The past several years of discoveries are changing what we know about these

animals and their social organization. Observations from as far apart as Sumatra, Belize, Costa Rica, Ecuador, and Brazil suggest that in all four species, wild tapirs' behavior patterns include much more companionship activity than previously believed.

Sumatra: Jeremy Holden and Debbie Martyr of FFI (Fauna and Flora International) have found repeated evidence in their camera traps of adult tapirs traveling in pairs and paired animals remaining together for years. Holden and Martyr report one striking bond: Holden found a freshly killed adult male tapir placed near a poachers' tiger trap for bait. Tracks showed that a second adult and a juvenile had stayed with the corpse.

Belize: An adult pair of Baird's tapirs (*Tapirus bairdii*), observed by flashlight, wandered into the camp of Sharon Matola.

Costa Rica: Charles and Sonia Foerster observed that one adult Baird's tapir waited for another adult until radio-collaring of the latter was complete. Also in Costa Rica, Eduardo Naranjo repeatedly observed groups of three tapirs, usually two adults and one juvenile. Two park guards interviewed separately reported seeing up to five tapirs walking together along streams.

Ecuador: Craig Downer's 14 sightings of mountain tapirs (*T. pinchaque*) in December 1996 included eight adults in male-female pairings. He believes December is the month they usually breed; during other

months, most observations have been solitary. Downer also suggests that tapirs may pair for defense when they and their habitat are threatened.

Brazil: Patricia Medici suggests that adult *T. terrestris* in her study area travel in two's; 135 km southeast, Vladimir Rocha also observes adults traveling together.

Clearly, the social behavior of wild tapirs is an exciting new area for study.

Central America

México

Baird's tapir (*Tapirus bairdii*)
Estimated population: Unknown

A new TSG member from México is Eduardo Naranjo, a student at the University of Florida, Gainesville. His interest in Baird's tapirs has included the following studies:

- a) Abundance, habitat use, and feeding habits of Baird's tapir in Corcovado National Park, Costa Rica;
- b) A survey on the ecology of Baird's tapir in the Costa Rican páramo;
- c) Two studies on distribution and population status of tapirs in Chiapas, México.

In February 1998, he reported: "This summer I will start a more

systematic phase of the work on tapirs and other ungulates in the Lacandon forest of Chiapas. This will be a long-term study and it will be the basis of my doctoral research."

Naranjo also gave suggestions for conservation of the Baird's tapir: "For Mexico and Central America, it is imperative to assure the protection of the remaining habitat for tapirs inside and outside the natural preserves. This will be possible only if the local people are aware of the importance of conserving the species, and of course, they must have alternatives for survival other than cutting the forest for farming and raising cattle. It is equally important to generate basic information on the distribution, abundance, and use of the species by local people.

In suggesting how the TSG might contribute to tapir conservation, Naranjo said, "The influence and solidity of our opinions on local, national, and international policies for conserving tapirs and other endangered wildlife species will be much stronger if we have the support and expertise of a diverse and well organized group of people with scientific knowledge and common goals." He also stated that permanent information exchange through the TSG Newsletter and Tapir Talk, and periodic meetings about every two years would help further the goals of the organization.

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Guatemala

Baird's tapir (*Tapirus bairdii*)
Estimated population: 1,000-2,000

Santiago Billy, a Guatemalan conservationist who has been studying scarlet macaws, *Ara macao*, in Laguna del Tigre National Park, northwest Guatemala, Peten Department, has reported

numerous signs of tapir activity in this area. However, increased oil exploration and drilling threatens this habitat as the building of roads will bring about more human activities there.

Belize

Baird's tapir (*Tapirus bairdii*)
Estimated population: 2,000-3,000

Report from the field

A week long field trip into the southern Maya Mountains of Belize, within the Chiquibul National Park, specifically investigating scarlet macaw activity there, also resulted in fifteen sightings of tapir within a six day period. All sightings occurred during daytime hours. At one time, two tapirs were noted to be browsing closely together along the riverside.

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Tapirs in a coloring book

Sharon Matola, Director of the Belize Zoo, reports that a coloring book featuring tapirs is in production, thanks to Dave Thompson, Director of Conservation at White Oak Conservation Center in Yulee, Florida. Mr. Thompson donated \$100 to the Belize Zoo specifically to help produce a coloring book that will feature tapirs.

This coloring book is important because it will be distributed in a country that has responded eagerly to two previous books about conservation: *The Adventures of Hoodwink the Owl* and *The Further Adventures of Hoodwink the Owl*. Both books, by Matola, show how Hoodwink learns about Belize's native wildlife.

These books, published in 1988 and 1993, respectively, fed Belize's emerging conservation awareness - started previously by the Belize Zoo

and Tropical Education Center. Now every public library in Belize has copies of these books.

Matola is hoping that, just as the Hoodwink books raised general conservation awareness in Belize, the coloring book will raise awareness of tapirs. While great strides have been made by Matola through the Belize Zoo and Tropical Education Center, much is still to be done. Tapirs are still eaten in Belize and habitat is still being destroyed. The coloring book will educate both children and adults.

It will be sold at the Belize Zoo and Tropical Education Center, and through the Zoo's web site:
<http://www.belize.net.com/belizezoo.html>

El Salvador

Baird's tapir (*Tapirus bairdii*)
Estimated Population: 0

It is believed that no tapirs remain in El Salvador.

Honduras

Baird's tapir (*Tapirus bairdii*)
Estimated population: 1,000-2,000 in protected areas; only protected areas are reported to have tapir activity

In November 1998, Hurricane Mitch wreaked unprecedented destruction in Honduras and other countries of Central America. On November 12, TSG member Leonel Marineros reported, "My country is devastated from the hurricane, and the activities in the protected areas are now more difficult. The emergency priority is the human being, and the reconstruction of the country is our next step. We don't know anything yet about the impact on biodiversity and protected areas, but the hurricane has obviously had a deep impact. I believe that on the Mosquitia coast many animals were killed by the flood, including tapirs. For example, manatees will become stranded and die because of becoming trapped in remaining water, or false lagoons

connected with the rivers if they cannot return to the river." Marineros has just completed a book:

Marineros, Leonel and F. Martinez-Gallegos. *Guía de campo de los Mamíferos de Honduras (A field guide to the mammals of Honduras)* 374 pages. In Spanish. 13 full color and 45 black and white illustrations; includes rats, bats, marine mammals, skulls and tracks). 53 distribution maps. Tapirs appear on pages 251-254.

The book also has newly-listed information about protected wild areas and a good bibliography. Each mammal is listed by its English name, common name in Honduras, characteristics, color, size, weight, natural history (diet, reproduction, habitat and additional notes) and its distribution in Honduras.

The book may be obtained by sending a money order for \$28 U.S. (includes shipping) to Marineros at the address below. It can also be purchased from Sheryl Todd by credit card (Visa, MasterCard, Amex) by e-mail: tapir@tapirback.com, or see further contact information on front cover of the newsletter.

Contact and book orders:

Leonel Marineros

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Nicaragua

Baird's tapir (*Tapirus bairdii*)
Estimated population: 500-1,000

Conservation work in Nicaragua has been problematic because of buried landmines, a remnant of the long civil war there. The situation has worsened due to Hurricane Mitch. Torrential rains have washed the landmines away, distributing them randomly and dangerously increasing the hazard which they present.

Costa Rica

Baird's tapir (*Tapirus bairdii*)
Estimated population: 1,000

Foerster project

The following is edited from a two-part report that appeared on Tapir Talk in June 1998. For maps, see Tapir Conservation, Number 7, October 1997, page 8.

Participants: Charles R. Foerster, MS, Project Ecologist; Sonia H. Foerster, DVM, Project Veterinarian; Dan Hilliard, Director of Zoo Conservation Outreach Group (ZCOG); Rich Bard, Tapir Keeper, Audubon Center for the Reproduction of Endangered Species (ACRES).

Charles defended his Master's thesis in April 1998. He graduated with an Honorable Mention from The National University of Costa Rica in Tropical Ecology/Wildlife Management. Sonia was accepted to Cornell University for a Postdoctoral Fellowship in Zoo and Wildlife Medicine.

We currently have sixteen animals radio-collared, eight of which were captured in January, 1998. Three of the eight females currently have offspring. We had left our field assistant, Jeremy Radachowsky, in Corcovado where he has been collecting radiotelemetry, behavioral and survivability data.

Goals for this trip included trying to collar one of the juveniles, observing as many radio-collared animals as possible to determine the condition of their collars, evaluating Jeremy's five months of data, training a new assistant (Alan Milan, a Costa Rican forestry graduate and former park guard in Tortuguero National Park), and evaluating political conditions that could affect our work. One positive outcome was the return of Paulino as head of the Sirena Station, as Paulino is an excellent naturalist and park guard. Additional good news: a corridor is planned between Corcovado and another park in the neck of the peninsula.

We traveled to Costa Rica via New Orleans, where the Audubon Zoo had

invited us to do a presentation on the project. They donated \$1,000 and lent us ACRES's tapir keeper, Rich Bard.

We arrived in San Jose, Costa Rica, May 7, 1998, and a few days later arrived at the park where we observed the effects of El Niño. The rainy season was late, and creeks were extremely low. On the day of our arrival, Paulino reported that a fish kill had begun the previous day. Hundreds of dead fish lined the Sirena River, and those still living seemed to be trying to escape the river by swimming up small tributaries. There was little water in these creeks, now filled with hundreds of large snapper and snook. We were curious about the cause of the kill and about its effects of it on other animals. The dead fish attracted hundreds of vultures; living fish accumulating in small pools attracted large cats such as jaguars and pumas, whose prints could be seen on the shores. The river was opaque and the color of tea. Neither shore birds nor crocodiles seemed to be affected, and crabs, shrimp and other crustaceans appeared healthy.

At first we could not find any of the tapirs that usually stayed near the station, and we wondered if the increase in large predators was the cause. Roberta had kept her offspring in about the same spot for a month, but now even she had moved outside the reach of our antennas. After three days, we got her signal at her usual spot. We were anxious to see the calf, who must now be around ten months old. Collaring him and following his movements after he separates from his mother will be extremely valuable for our study. But, when we tried to locate her, she ran, leaving only the distinct stomping sound tapirs make to scare and confuse pursuers. There was a well-worn flat area on the shore of a creek, surprisingly exposed, where she spent her days. There were several escape routes, and she had been using the nearby creek as a water source and for defecation. One of the pools is deep enough for submerging. We left bananas in hopes that she would return.

The first radio-collared animal we saw was Flash. His territory, along with Big Mama's, is closest to Sirena station,

and will attempt to clarify if and how *T. pinchaque* uses the páramo as a feeding and resting area. From information learned and methods perfected in these studies, they will go on to try to estimate the population of *T. pinchaque* in Colombia. They report that in their study area the forest is quite fragmented in the lower zone, but is less so in the upper zone; higher still, the páramo is in very good condition.

Diego Lizcano adds that while the project is currently located in the Departamento de Tolima, it will soon move to other sites along the Cordillera Central in Colombia.

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Colombia's tapirs

In southern Colombia, we have a network of reserves owned mainly by local townspeople and farmers. While making assessments and biodiversity inventories of these reserves over the last three years, I have found relict populations of mountain tapirs (*Tapirus pinchaque*) in spectacular páramos and mountain jungles. Besides tapirs, there remain spectacled bears and other rare mammals, such as pudu deer, mountain woolly monkey, Andean wolf, puma, and the mountain harpy eagle (*Oroaetus isidori*).

But the news overall is not good. After three years in the mountains of southern Colombia, I have found that the trend towards extinction of *T. pinchaque* continues at a fast pace. On the Putumayo/Nariño border, very important areas for tapir and other Andean wildlife, the destruction continues even with increased conservation awareness by the local communities. The city government of

Pasto is planning to dam the upper Guamues River. This project, the "Multipurpose Project," will generate electricity, fresh water and irrigation, but it will also mean that huge areas of páramo and prime mountain tapir habitat will be flooded. Penetration into the area by project workers resulted in the killing of a female mountain tapir last December. Her calf was taken alive, but we have been unable to locate it. We fear that it may have been taken to a zoo outside of Colombia. (There are currently neither *T. pinchaque* nor *T. bairdii* in any Colombian zoo that we are aware of. Sometimes rare Colombian animals are used in exchanges with foreign zoos for animals such as zebras or camels that are hard for a Colombian zoo to obtain.) [Ed note: *Wealthy private collectors will also pay illegally for rare species.*] Opening of the upper Guamues area is also bringing local hunters. We suspect that in the last fifty years, hunting has been responsible for killing hundreds of mountain tapirs throughout its range. In Colombia, hunting has decimated mountain tapir populations in the northern part of the Eastern Cordillera (possibly up to the border of Venezuela), in the central and southern parts of the country, the Southern Andes in Nariño south to Ecuador and Peru, and most of the Central Cordillera as far north as Los Nevados National park or Nevado del Ruiz. No records exist for the Western Cordillera, but tapirs have been observed on the upper ridges.

Due to control by local authorities, a good-sized population seems to be recovering in the Macizo Central region after almost being wiped out by hunters. In the Sumapaz region, south of Bogotá, both mountain tapirs and spectacled bears are reported to be abundant due to control by guerrillas (FARC, Revolutionary Colombian Armed Forces) in the area. They have announced that it is forbidden to molest or kill either of these species, and harsh penalties are exacted from those who do so.

Until the 1960s, the mountain tapir was quite abundant around Laguna de

La Cocha. The tapir population in this area was abundant and so unafraid of humans that hunters were able to kill them easily. They were tracked with dogs and chased into rivers, where they were then killed with machetes, spears or shotguns (methods still used for hunting mountain tapirs). In the last twenty years, the mountain tapir has been reported as very rare by the local community, although they say that the animal still exists in páramos and forests further from the village.

Recently I have heard from a reliable source that the mountain tapir is quite abundant in the southern part of the Páramo de Sumapaz, the largest of the Andean páramos, located south of Bogotá, on the Eastern Cordillera. There is a strong guerilla presence in the area, which insures the protection of mountain tapir, spectacled bear and other rare wildlife.

It will be important for us to learn where in Colombia the abundant populations of mountain tapirs are located. I hope to be able to take part in such an effort if resources can be found. Once the project is undertaken, it will be necessary to move cautiously, because the guerrillas are very strong in many of the andes of Colombia, and the war will pose threats to researchers. It is rather incredible to observe that the guerrillas are trying to preserve the species by means of strict laws and enforcement, where the government of Colombia has failed through inability and lack of interest.

In January 1998 researchers found abundant tracks of an unknown species at 3000 m on the western slope of the Farallones de Cali in the Western Cordillera. It could be either *T. pinchaque* or *T. bairdii*. Baird's tapir is reported to reach elevations of 3600 m (Tapir Action Plan p. 31), while the mountain tapir may descend to 1400 m (Downer 1997). Today, *T. bairdii* is very rare in the jungles of western Colombia (the Choco), but locals still report it in a few inaccessible areas. No recent reports have been published on this species in Colombia.

There is a contact zone between *T. bairdii* and *T. terrestris colombianus* where both species are sympatric (the upper

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There is a contact zone between *T. bairdii* and *T. terrestris colombianus* where both species are sympatric (the upper

Sinú and Paramillo National Park). Studies on their interaction (and presence of hybrids?) and current status are urgently needed. If *T. pinchaque* is found in the upper ridges of the Western Cordillera, there could be a contact zone between it and *T. bairdii*.

In Colombia there is also a rare and very endangered subspecies of *T. terrestris*, *T. terrestris colombianus*, which inhabits the jungles of the Magdalena Medio, the Sierra Nevada de Santa Marta, the Catatumbo and the upper Sinú River (an important watershed in the northern Andes). This is quite different from the more common eastern lowland tapir (from the Llanos and Amazonia). The subspecies is almost wiped out, but it still inhabits the Serranía de San Lucas, one of areas in the world most overrun with noncommercial (personal) mines. It also exists in some sectors of the upper Sinú River.

In Colombia we also have *T. terrestris*, or eastern [lowland] tapir; it inhabits the eastern planes or Llanos, in the gallery forests along the water bodies, but it is now rare in most of its Llanos range due to overhunting. It subsists in remote areas but it is always taken as the prime hunting trophy. Even local indigenous people have decimated their tapir populations due to encroachment of their territories and overhunting. In the Amazon jungles it is quite abundant in some remote areas, but elsewhere, especially near important rivers and communities it is overhunted and now very rare.

Our network of private reserves has achieved success by combining education and incentives. In fact, it has now become a model for a similar program in Ecuador supported by (but independent from) Fundación Natura. To achieve success, it is necessary that the local community understands the importance of conservation, so a good education program is needed along with the conservation program. Recognition and even incentives for the program aimed to support the local communities and their well-being are also very important; this can be achieved when other communities and people from outside the local region

begin to visit the community and ask them about their conservation program. However, until the local program is fully established, the community has to have a counterplan in case the local hunters appear. We have to be careful about giving exact localities for the presence of animals, because not only local hunters but professional hunters for the zoo trade are looking for areas with tapirs.

Of course, the participation and will of the local community is the first and most important requirement, and sometimes it is advisable to work with the local authorities and leaders. A good point is to work with local children and youth, to build up an ecological movement and begin the education and conservation efforts at the same time.

Colombia is the only country that still has three species of *Tapirus* (and one subspecies), but if nothing is done, this world record won't last much longer.

Emilio Constantino

Advisor

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Venezuela

Lowland tapir (*Tapirus terrestris*)
Estimated population: Unknown

Mountain tapir (*Tapirus pinchaque*)
It is unknown if this species ever lived in Venezuela; if so, it is probably extinct there now

One new TSG member is Denis Alexander Torres of Venezuela, an environmentalist and nature illustrator. Dennis Torres has a strong interest in tapirs, although his primary research for the past eight years has been with the Andean or spectacled bear (*Tremarctos ornatus*) in the mountains of Venezuela. As of last spring, he was planning studies on Andean mammals, hoping to learn, among other things, something about the distribution and status of *Tapirus*

terrestris in the Venezuelan Andes. He reports that information available about this species in the region is very scarce.

Torres also coordinates environmental education programs in rural schools. He suggests that in Venezuela it is very important to promote research on tapirs and other large tropical mammals. "Unfortunately, here the principal interest is directed toward small mammals, mainly rodents and bats." He emphasizes the importance of getting information to the public about the tapir and its conservation. Research techniques used in other countries for these large mammals would be welcomed as an adjunct to current education in Venezuela.

Although factual information is rare, there is already an interest in tapirs through culture and folklore. "For example, last year the tapir was the logo for the National Juvenile Sport Games celebrated in Yaracuy State." Near this city is located the Maria Lionza Natural Monument, a protected area which includes tapirs. This location is the site of a indigenous legend about the tapir and an Indian princess named Maria Lionza. A large statue of the princess riding a tapir can be found in Caracas.

Torres also suggests that an international database of information collected from work done on various tapir research projects would be extremely valuable.

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Trinidad & Tobago

Lowland tapir (*Tapirus terrestris*)
Estimated population: Unknown

No report.

Guyana

Lowland tapir (*Tapirus terrestris*)
Estimated population: Unknown

No report.

Surinam

Lowland tapir (*Tapirus terrestris*)
Estimated population: Unknown

No report.

French Guiana

Lowland tapir (*Tapirus terrestris*)
Estimated population: Unknown

No report.

Brasil

Lowland tapir (*Tapirus terrestris*)
Estimated population: Unknown

Medici study moves into new phase

Throughout 1997, Patrícia Medici and her team continued their study of *Tapirus terrestris* auto-ecology and behavior in Morro do Diabo State Park, a protected area in the Brazilian Atlantic forest of the Pontal do Paranapanema Region, Western São Paulo State, Brasil. In the latter part of 1998 and moving into 1999, the project has taken on a broader aspect. Medici and her associates (the IPÊ team), are conducting a project entitled, "The Conservation Status of Jaguars, Pumas and Tapirs and their Potential as Landscape Detectives for the Brazilian Atlantic Forest." The Brazilian Atlantic Forest is one of the most threatened biomes in the world.

As in previous years, the tapir portion of the project is managed by Patrícia Medici, Conservation Biologist. Overall project manager is Laury Cullen, Jr., Research Manager. Medici and Cullen are both Brazilian. Other Brazilians on the project are

Paulo Mangini, Veterinarian, and Conservation Biologist Claudio Valladares Padua, PhD. Two Americans are on the team: Beatriz Perez-Sweeney, Molecular Geneticist, and Don Melnick, PhD, also a Molecular Geneticist.

The aim of this project is to protect one of the last remaining Atlantic Forest populations of jaguars, pumas, and lowland tapirs. All are listed in the "red book" of Brazilian threatened species and ranked on other threatened and/or vulnerable species lists (IUCN, 1996, 1997). The project will indirectly benefit other key and related prey species such as, peccaries, deer and agoutis still present in the study region.

Patrícia Medici began trapping her first tapirs in 1996, and preliminary field work on this new area of the project (using the three species as landscape detectives) began in January 1998. The project should cover a three year period. Objectives include:

- Estimation of population size for jaguars, pumas and tapirs in Morro do Diabo State Park and neighboring Atlantic Forest fragments;
- Description of home range size;
- Analyses of genetic variability;
- Description and mapping of the principal daily and dispersal routes throughout the landscape using the three collared species as "landscape detectives;" this will indicate the potential areas to be conserved and restored as wildlife corridors.

Individuals will be trapped and radio-collared, and their movements mapped. Preliminary population estimates suggest that not more than 15 jaguars, 15 pumas and 400 tapirs survive in the Pontal do Paranapanema Region, consisting of the 35,000 ha forest of the Morro do Diabo State Park and the 10,000 ha of surrounding forest fragments. These numbers are well below the viable number of 500 recommended for long-term population viability and survival.

Preliminary information has shown that these species still survive in very small forest patches, mainly because they are able to exploit surrounding resources and move long distances between forest fragments.

Long-term conservation will probably require measures to rescue their genetic variability. The team also plans to restore and conserve the most used dispersion routes or corridors, keeping landscape connectivity and, therefore, the metapopulation scenario for these large and keystone species for this threatened ecosystem.

The Brazilian Atlantic Forest supports 8% of species on the planet, many of them endemic and threatened with extinction. Today these Plateau Forests are the most threatened ecosystem of the Atlantic Forest. Approximately 2% of the original cover remains. Nearly all remaining forest in the Plateau is found in the Pontal do Paranapanema region, in the extreme western "point" of São Paulo State. This region alone supports 85% of all the Plateau ecosystem in the state, and a large part of this percentage is represented by the 35,000 hectares of Morro do Diabo State Park. Notable among the diverse fauna in the Park is the rare and endemic black-lion tamarin.

The loss of large ungulates such as tapirs may trigger adverse effects in the Plateau remnants and affect ecosystem integrity. The scanty evidence available from the Atlantic Forest leads the team to believe that the absence of tapir, peccaries and deer may also cause disruptions of some key ecological process, such as seed predation, dispersal and nutrient recycling that help to maintain biodiversity and ecosystem functioning.

Information gained from the study will facilitate implementation of two management plans critical to the conservation of this ecosystem: (1) metapopulation management of large carnivores and tapirs and (2) restoration of main wildlife corridors.

Between 1996 and 1998, Patrícia Medici radio-collared eight (3.5) lowland tapirs. (One died in 1998, a sub-adult male, possibly killed by a jaguar or by snake bite.) The most recent capture occurred in December, 1998, during Sharon Matola's visit. She was present for manipulation and collaring. In the study region, the team has documented that jaguars, pumas and tapirs frequently wander outside

large forests sources, such as Morro do Diabo State Park. They cross open areas using degraded forest corridors along rivers in order to reach forest fragments. These individuals appear to use the smaller fragments as stepping stones during their temporary movements outside main forest. Therefore, these species will be used as "landscape detectives," indicating the most frequented dispersal routes and pathways.

The capture goal is 30-40% of the total jaguar and puma population and 10% of the lowland tapir population. This is considered a significant sample size for analysis in felines (Rabinowitz, 1993) and tapirs (IUCN, 1997). These percentages represents 5-6 individuals of each carnivore and about 20-25 tapirs. Pitfall traps will continue to be used for tapirs. They consist of a hole 210 x 150 x 230 cm covered and camouflaged with forest debris. This method has proven very successful and safe for the eight tapirs already captured.

For tapirs, the veterinarian responsible for anesthetizing captured animals uses a CO₂ gun with adjustable pressure (Telinject USA, Inc.) and a syringe dart with a 0.7 inch needle (long enough to avoid reaching bone other vital tissues). The new protocol is based on a combination of Medetomidine Hydrochloride (Domitor) and Telazol. When necessary, a medetomidine reversing agent will be used. The name of this antagonist drug is Atipemazole Hydrochloride (Antisedan). Corporal measurements, weights, sex and general health will be recorded for each animal.

After fitting the animals with radio-collars, they will be tracked on foot, by car, or airplane, depending on terrain conditions. The animal's position will be triangulated and plotted on a latitude/longitude grid using CAMRIS 3.46 (Computer Aided Mapping Resource Inventory System). GPS will be used for the marking of coordinates of the location areas.

Genetic information will be used to analyze evidence of inbreeding, social structures, and the construction of pedigrees. These will facilitate analyses

of inbreeding coefficients, social systems, demography, and the long term genetic viability of the populations.

Blood and sperm samples will be collected from captured animals. The sperm of male individuals usually contains significant quantities of semen to detect morphological defects on individual spermatozooids. This can provide important information about an individual's reproductive viability. Also, blood and external parasites will be collected for analysis of possible diseases. These analyses will be carried out in the Molecular Genetics Laboratory at CERC (Center of Environmental Research and Conservation), Columbia University, New York.

Future metapopulation management may include the shifting (i.e. reintroductions, translocations and managed long distance dispersal) of individuals among fragments. Guaranteeing the permanence of these key carnivores and ungulates, along with their ecological roles in the ecosystem is a national responsibility.

Acknowledgements: Fundo Nacional do Meio Ambiente (FNMA, Brazilian Government), Forestry Institute of São Paulo State (IF/SMA), Ecological Station of Assis (IF/SMA), Smithsonian Institution, IBAMA, WPTI (Wildlife Preservation Trust International), TPF (Tapir Preservation Fund), TSG (Tapir Specialist Group, IUCN), Lincoln Park Zoo, Brookfield Zoo (Chicago Zoological Society).

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<http://www.columbia.edu/cu/cerc/IPE/detectives.html>

Tapirs still found in Rio Grande do Sul

Renato Affonso, has recently completed a project in the state of Rio Grande do Sul (extreme south of Brazil). His study site was the Estação Ecológica de Aracuri (Ecological Station of Aracuri). The project, which will result in a thesis, involved area use by tapirs. This is especially good news, as Patrícia Medici reports having been told many times by people from the south that tapirs no longer existed in the state of Rio Grande do Sul. After completing his study, Affonso began teaching at the Juiz de Fora University in Minas Gerais State, Brasil.

Ecuador

Baird's tapir (*Tapirus bairdii*)
Estimated population: Unknown; probably extinct

Mountain tapir (*Tapirus pinchaque*)
Estimated population: 1,000

Lowland tapir (*Tapirus terrestris*)
Estimated population: Unknown

Craig Downer reports

The mountain tapir project in Ecuador is progressing reasonably well. Ruben Nuñez continues to give environmental education talks with slide and film showings in communities around the Sangay and Llanganates National Parks. In addition, he works with some of these communities on developing alternative lifestyles that would obviate the need to continue destroying the remaining cloud forests and paramos through slash and burn. Unsound agricultural practices need to be curtailed if true success is to be achieved. These practices include cultivating slopes that are much too steep and grazing cattle and sheep on these same steep slopes, often after the topsoil has been stripped by years of exposure through cultivation.

It is necessary to get people to care about the mountain tapir and the highland ecosystem from which it is inseparable, to value the animal both in

its own right and for the tremendous ecological service which it provides. I have spoken before of the "living sponge" which the Andean forests and páramos constitute. In the talks given by Ruben and myself we stress the vital importance of the highland watersheds remaining intact where still intact or being restored where destructive inroads have been made. We point out the crucial role which is played by the mountain tapir in disseminating a large percentage of the seeds of flowering plants so that they may successfully germinate in the fertile bed which the tapirs feces provide. In my study area of Sangay N.P. the mountain tapir was estimated to disseminate 33% of the species of flowering plants found there, according to germination experiments and my comparison of transect with dietary analysis. More complete analysis of these results should soon be published.

Public education is a beginning, but it must be followed up by action. For example, cattle must be expelled from the Culebrillas and Yanayacu sectors of Sangay National Park and people living in the area of the parks must be encouraged to adopt ecologically sustainable lifestyles.

A march took place on the 29th of April, 1998, in Ambato, the capital of Tungurahua state, Ecuador. Ruben and I helped organize this together with officials, school teachers and students. The march received considerable attention both locally and nationally, and a major newspaper out of Quito, *El Comercio*, promised to investigate the Culebrillas sector's problem with cattle invasion. However, I believe that articles addressing these issues need a clearer focus on the precise conservation requirements needed for tapirs to survive in the wild.

An example would be the suggestion to secure more areas under the firm protection of the law and the conscientious protection of the local citizenry. For a decade or longer, the mountain tapir has been legally protected in all three countries of its occurrence: Peru, Ecuador and Colombia. It is on CITES Appendix I, and international trade in this animal,

alive or dead, is forbidden under treaty. However, this species continues to decline due to overhunting and, especially in the border areas, trade in its parts. Both Piura and Cajamarca states of northwestern Peru near the frontier of Ecuador deserve particular attention. Here there is considerable trade in animal parts for traditional medicine in Sullana and Piura as well as other cities in Peru and Ecuador. The governments need to enforce the laws already on the books to show that they are serious about saving the mountain tapirs. Evidence has shown that an alarming number of Ecuador's tapirs end up in Peruvian markets. What is needed is a concerted international effort to end the illegal sales and trafficking. This could be accomplished through a combination of public education and effective and well-publicized law enforcement.

The effort to create an international peace park in the frontier regions of southern Ecuador and northern Peru may become a reality. Such a park would help ameliorate differences between these two nations and would help save a large part of the most extensive mountain tapir occupied region remaining. This new park involves the Cordillera del Condor, a fascinating biogeographical region containing a mixture of plant and animal species from the wetter northern Andes and the drier central Andes. The yellow tailed woolly monkey co-occurs here with the mountain tapir and recently a new species of spiny rat was discovered by Dr. Luis Albuja, a mammalogist from the Escuela Politecnica Nacional in Quito. By establishing an extensive international park of at least 300,000 hectares in this region, many vital ecological services, including equitable water provision, would be maintained and seriously endangered species such as the mountain tapir would be safeguarded in long-term viable populations. Ecotourism could be developed in association with the park, but should be limited so as to not overly impact.

Beginning in December 1998, I will be working on a mountain tapir relocation project in northern Ecuador.

A nature film company will film this translocation project for distribution.

Finally, a Korean film company will produce an English version of a film on the mountain tapirs made earlier this year with the help of myself and Ruben Nuñez. This film was shown at a Japanese Earth Film Festival in late August 1998. A Spanish-language version of the film is also promised by the producer for use in grass roots education. A book with a chapter on the mountain tapirs and magazine articles in Korean will be published shortly. I have provided photos for both endeavors.

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Nuñez's work expands

During 1998, Rubén Nuñez of Baños, Tungurahua, Ecuador, expanded his work with local ecology education. He has expanded the number of Ecology Clubs from about six to forty over the past year and has spent much of 1998 developing a strong interest through Tungurahua and neighboring provinces in conservation of mountain tapir habitat. Grants from the Columbus Zoo, Pittsburgh Zoo, Tapir Preservation Fund and private donors have aided his work. As Director for the Tapir Preservation Fund in Ecuador, Nuñez has brought the tapir to the forefront of conservation awareness in Central Ecuador, reaching about 12,000 to 24,000 people annually in his lectures and conferences. During the latter part of 1998 and moving into 1999, Nuñez has worked with INEFAN (the National Park Service in Ecuador) and the Tapir Preservation Fund to begin to set aside preserve areas bordering Sangay National Park and the newly designated Llanganates National Park - both important conservation areas for *Tapirus pinchaque*. We are preparing a detailed report for the March, 1999, *Tapir Conservation Newsletter*.

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Peru

Lowland tapir (*Tapirus terrestris*)
Estimated population: Unknown

Mountain tapir (*Tapirus pinchaque*)
Estimated population: 200

Jorge Cebreros reports seeing tracks and feces of mountain tapir at approximately seven of the lakes in the Tabaconas/Namballe National Sanctuary which borders the Tabaconas Valley (aka "Spectacled Bear National Sanctuary") earlier this year. The lakes are at an elevation of about 3,400m and the lowland tapir is not known to exist over 1500m (Downer 1996) or 2000m (Constantino, pers. comm.). A large number of bear and puma tracks were also seen.

The local Forestry Department has just made a trail to these lakes. If hikers use only the prepared trail, there will be less damage to the fragile ecosystem than if each person entering the area creates his own pathway. These pathways can even be accidental, as it's difficult to walk on the steep, muddy slope without creating a trail. Trails used by humans were often created first by tapirs and are still used by them. "The whole area surrounding the lakes is like a sponge," says Cebreros, "and just stepping on this sponge can leave a permanent footprint. Hopefully by educating the local people we can help offset any potential damage before it's too late. SIAT (Instituto para la Agricultura Sustentable del Trópico), along with its staff, is willing to help. In our area there is much superstition, and I have personally seen many hooves in the local markets. People still hunt for tapirs here." SIAT uses both the spectacled bear and the mountain tapir on their logo.

An expedition to the lakes will take place during the first week of November, 1998. About 12 people, mostly from the Forestry Department, are going to look for the mountain tapir and make an inventory of the

flora. They plan to stay about a week. They would like to set up a permanent lookout to confirm the mountain tapirs' existence here. There is some concern about whether the tapirs will leave the area if they are disturbed. The Forestry Service hopes to set aside areas that will maintain the pristine environment and will be off limits to humans. "

Jorge Cebreros

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Bolivia

Lowland tapir (*Tapirus terrestris*)
Estimated population: Unknown

The Museum of Natural History "Noel Kempff Mercado" in Santa Cruz, Bolivia, is working on a study to determine whether any differences exist between the lowland tapir (*Tapirus terrestris*) found in the dry forests of southern Bolivia and the lowland tapir that inhabits Brazil's Amazon region. The museum has not been able to locate any published studies that would reveal genetic variations.

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Paraguay

Lowland tapir (*Tapirus terrestris*)
Estimated population: Unknown

No report.

Argentina

Lowland tapir (*Tapirus terrestris*)
Estimated population: Unknown

No report.

Uruguay

Lowland tapir (*Tapirus terrestris*)
Estimated population: Unknown

No report.

Southeast Asia

Myanmar (Burma)

Malayan tapir (*Tapirus indicus*)
Estimated population: Unknown

No report.

Laos

Malayan tapir (*Tapirus indicus*)
Estimated population: Unknown

No report.

Vietnam

Malayan tapir (*Tapirus indicus*)
Estimated population: Unknown

No report.

Thailand

Malayan tapir (*Tapirus indicus*)
Estimated population: 3,500 (updated)

Although the Royal Forest Department (RFD) has not carried out any research on the Malayan tapir (*Tapirus indicus*), they, along with Mahidol University in Bangkok, manage a database of sightings/distribution of endangered

species. This database contains some interesting tapir data, including the following:

% original habitat lost = 62.4
% original habitat protected = 14.1
% remaining habitat protected = 37.4
Expected protected population = 1900
Expected total population = 3500

The database is considered reliable, since only 100% definite sightings are entered. Most of the information has been collected while the RFD were training 700 tiger rangers throughout Thailand. Although established in 1986, the majority of data has been collected in the last few years.

Confirmed areas of tapir distribution	total area / status*
Khao Pra-Bang Khram	173km ² 4
Khao Luang	570km ² 4
Erawan	467km ² 4
Sai Yok	912km ² 4
Khao Sok	693km ² 5
Kaeng Krachan	3083km ² 4
Khao Phanom Bencha	50km ² 4
Khao Pu-Khao Ya	641km ² 4
Khao Lam Pi-Hat TM	74km ² 4
Khlong Nakha	463km ² 4
Huai Kha Khaeng	2575km ² 4
Thungyai Naresuan	3200km ² 4
Khlong Saeng	1046km ² 4
Ton Nga Chang	184km ² 4
Khlong Phraya	121km ² 4
Umphang	2548km ² 4

*4 = Scarce < 1 animal/sq. km
5 = Occasional > 1 but < 10 animals/sq. km

Information submitted by:
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Cambodia

Malayan tapir (*Tapirus indicus*)
Estimated population: Unknown

No report.

Malaysia

Malayan tapir (*Tapirus indicus*)
Estimated population: Unknown

No report.

Indonesia

Malayan tapir (*Tapirus indicus*)
Estimated population: Unknown

Sumatra is the one place in Indonesia where tapirs still exist in the wild. In recent times they have lived on the islands of Java and Borneo, but are now confined to Sumatra. Not only is that island the last refuge of tapirs in this country, but the Sumatran tapir has by some been given the status of subspecies, *Tapirus indicus sumatranus*, while the mainland species is called *Tapirus indicus indicus*. Since locations of wild-caught tapirs are unknown (more often than not) and since the Sumatran and mainland tapirs have been interbred in zoos for decades, the wild Sumatran tapir is our only chance to study this subspecies alive. No-one knows how many are left. There has never been a serious study on the distribution and numbers of the tapir in Sumatra. There is some information available on areas where tapir have been recorded or are believed to be present, obtained from management plans, survey reports and similar sources. Some of this (with errors) has been summarized by Charles Santiapillai in *Tiger Paper*. Nico van Strien suggests that "it would be useful to extract tapir data from the more recent field studies and survey reports. Another source of distribution data is the large number of environmental impact studies that have been produced in recent years for all logging concessions and all large development projects. But tracing such documents can be very time consuming, and the reliability of the information varies.

"At this moment there is no fieldwork being done on tapir, *per se*, although some data are obtained through other field studies such as the tiger survey in Way Kambas and the GEF rhino project in Barisan Selatan and Kerinci-Seblat National Parks. So far, recent information has not been summarized and evaluated.

"There is very little interest in the tapir in Indonesia, and the general opinion is that the situation is such that no special protection measures are required. There is little hunting

pressure on tapirs, because they do not have highly priced parts and Muslims usually refrain from eating its meat. Tapirs are usually not particularly rare wherever there is enough good habitat." (Data cited, Van Strien 1998, pers. comm.)

Threats to habitat

The following has been edited from report issued by WWF on the 1997 and 1998 fires in Indonesia.

In 1997 and 1998, fires and resulting haze caused extensive and serious damage to tapir habitat in Sumatra, although little is known of the actual impact on the tapirs. Southern Sumatra, one of the last strongholds of this species, and the only place they still exist in Indonesia, was one of the locations hardest hit by fires. These lowland forests are among the most species-rich on earth, and during the past two years, some of the last intact lowland forest in Sumatra was destroyed. The forests of southern Sumatra were already under serious threat, as "virtually all of the lowland forest in Sumatra" had already been logged and cleared, replacing tapir habitat with plantations of oil palm, a tree native to Africa. Jatna Supriatna, director of Conservation International's Indonesia program, stated in October 1998 that primary forests in Indonesia were vanishing at a rate of one million hectares a year. Plantations of oil palm and trees grown for pulp production have expanded rapidly during this decade and are poised to expand even faster in the years ahead. Some reports from Southeast Asia suggest that tapirs may coexist with rubber plantations to some extent, but in Sumatra they reportedly shun the oil palm. While tapirs seem to be able to find food readily in some secondary and disturbed forests, disturbed forest is much more fire prone. And since the cause of most of the past two years' fires was directly linked to forest clearing (though exacerbated by a bad El Niño year), the remaining forest is now especially vulnerable. Expansion of oil palm plantations and the poor management

practices that go with it is probably the largest single driving force behind deforestation in Indonesia.

Forest fires in Sumatra are not new. In addition to natural fires, man-made fires have been used to improve hunting and to clear plots for agriculture. However, "earlier fires were undoubtedly smaller in area and probably more spread out over time than the fires of the past two decades."

Proper management of forest and land resources in Sumatra and Kalimantan (Indonesian Borneo) could lessen the possibility of such an event happening again.

Southern Sumatra

Relevant chapters from *Tapirs: Status Survey and Conservation Action Plan* have been distributed to the Anti-Poaching Patrol (Sumatran Rhino Protection Unit) in Bengkulu, to Taman Nasional Kerinci Seblat and to local nature protection units.

Tapirs appear occasionally in photo traps used by Jeremy Holden and Debbie Martyr in Sumatra. Holden and Martyr have also been collecting observations about "companion bonding" of tapirs and rhinos. In 23 months over a three-year span, Martyr was the only one of the team to have clearly seen a tapir. "Ironically the animal I saw was not in the forest but walked across a gravel road in front of me." This occurred in primary forest.

A report was submitted to Fauna and Flora International, Lembaga Ilmu Pengatuhuan Indonesia, PHPA: *Project Orang Pendek - Photo-trapping April 1996-March 1997*, by Jeremy Holden, et al.). We hope to be able to print tapir data from the report next issue.

Standard texts on tapirs often report that the fourth digit of the tapir's front foot is visible only in soft ground. Martyr reports that this digit "seems to be functional in most terrains but since animals tend to overprint (thus producing a footprint with five rather than four toes). The fourth digit is not always as clear as you might expect."

When we commented that "one source called tapir 'plentiful' in Sumatra," she replied, "In suitable

habitat, tapir will be present, the question is one of suitable habitat - i.e., we've never heard of tapir in oil palm. Maybe the best phrase would be "not uncommon" (though density is variable) in suitable habitat which ranges from mature (mixed) rubber plantations through to primary forest and at altitude ranging 05m-2300m. However, our proviso in certain damaged forest types is the frequency and success of breeding. In three years out here we've only once encountered infant tapir prints. These were in protected but disturbed hill forest c. 900m, and to date [September 7, 1998] we have not photographed infants in the camera traps."

Late in 1998, the team had their first experience of multiple species showing up in a trap photo. Tapir was one species, deer was the other.

In Way Kambas, Neil Franklin and the Sumatran Tiger Project have been photo-trapping many tapir. Here the team is also trying to determine whether tigers can kill an adult tapir. (For a discussion on this subject regarding Neotropical cats and tapirs, see *Tapir Conservation*, No. 7, pp. 2-3). Although the tiger is larger and heavier than Neotropical cats, the Malayan tapir is also larger and heavier than its new world cousins. Debbie Martyr says, "We have no evidence of tiger taking adult tapir and while Jeremy has got pictures of barking deer with fresh tiger wounds, he has no pictures of tapir with scars indicating old, unsuccessful attack by tiger. We also know tapir will, on occasion, walk long distances on trails used by tiger, which may indicate lack of concern. . . . I have only ever twice encountered tapir (skeletal) remains, once on an old logging trail and once in relatively newly reopened ladang at the forest's edge. In the latter case I think the animal may have been shot by sport hunters. In the first instance only part of the skeleton remained . . . cause of death impossible to speculate. We'd guess that young and sick tapir would be an obvious target, however providing the alternative (deer, pig, monkey) prey base is sufficient, I don't see why tiger should actively seek out a

large adult tapir. That said, Sumatran tiger can and will take domestic cattle under certain circumstances. I personally think a Sumatran tiger is perfectly able to take an adult tapir but that, like most cats, they prefer easy prey where possible. This is the discussion, but the bottom line is, we are not sure.

Jeremy Holden and Debbie Martyr

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Central Sumatra

The rule of thumb is that tapirs occur south of Lake Toba in Sumatra and orangutans occur north of Lake Toba. The lake is located about one quarter of the distance from the north end of the narrow island. In the course of surveying work, Erik Meijaard has collected data on where tapir could occur. Of the data he says, "All of them rely on indirect information from local informants, but I judge them as relatively reliable."

1. Batang Gadis area: Malay tapir presence mentioned by Giesen & van Balen (1991).

2. Batang Toru area (north-east of Sibolga township): local Batak people said that tapirs occurred in relatively high densities in this hilly and still well forested area.

3. Dolok Surunggan Wildlife Reserve - south-east of Lake Toba - local informants told that tapirs occur in this area.

Giesen, W. & Balen van, B. 1991. *Several short surveys of Sumatra wetlands. Notes and Observations. PHPA/AWB Sumatra Wetlands Project Report No. 26.*

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FROM CAPTIVITY

Behavioral study

Tapirs in zoos: their behavior, and interest they generate in visitors

Aim of the study.

Even if tapirs in zoos are not among the most popular creatures, they are unusual and rare enough to be worth study and support. Thus this research project, which I began in 1997 for my thesis at Heidelberg University in Germany. This comparative study of the four species of tapirs in zoos combines two major aspects of animal management:

- the behavior of tapirs that are under human care
- the response of zoo visitors to these tapirs

To these ends, data collection and analysis in this study concentrate both on tapirs, and on their visitors.

- *Tapirs*: What are their daytime activities? What are the inter-species and intra-species interactions? Records of interactions include the conditions under which animals are kept: number of individuals, size and structure of enclosure, feeding times.
- *Visitors*: How many visitors come to the exhibit? What do they say? How do they mis-identify the tapirs? What are their reactions to them? What are their opinions of the exhibit? What is their general knowledge about tapirs?

In addition to gathering and analyzing this data, I plan to make this data the foundation of some basic experiments relating to behavioral enrichment. These observations of the behavior of tapirs at different zoos, and how the tapirs are assessed by visitors, can produce data useful for two basic zoo missions: optimizing animal maintenance, and optimizing the presentation of species in a way that will educate the public.

Methods

Absent available ethograms for all

tapirs, this gap must be filled by recording behavior patterns for the four species. The activities and interactions of the individuals are measured two ways: by scan sampling, and in relation to the "focal animal" (the individual that the researcher is studying at the time of the interaction). Furthermore, the number of visitors to the tapir exhibit, and the total time the visitor views the tapirs, are recorded. An additional number of people queried by survey.

General notes on any remarkable events complete the documentation. Most of the measurements are taken in front of the outdoor enclosures.

Unfortunately, due to limited time available to study each exhibit, mating or breeding behavior cannot be observed systematically.

After a visit to the Los Angeles Zoo in October 1998, I have spent more than 1000 hours observing some 32 individuals of all four tapir species, and several thousand visitors at seven different zoos. Further trips are planned over the next two years.

Results

Behavior differences are rarely specific to one species or sex. Some exceptions include:

- Two female South American tapirs at the Berlin and Dortmund Zoos were the only tapirs observed standing freely and vertically on their hind legs for picking at branches. Their male counterparts showed specific urine-splashing on the females during mating times.
- A four-week-old Malayan tapir at the Dortmund Zoo, and a 14-month-old mountain tapir at the Los Angeles Zoo, were seen digging in the sand using their trunks. Furthermore, both these tapirs tasted their mothers' feces.

In general, mountain tapirs were not observed using water pools for defecation, but they showed more social interactions (especially coat licking) than other tapirs.

An interesting reaction of all tapirs to being scratched is lying on their



Stefan Seitz with a lowland tapir at the Berlin Zoo. Photo © 1998 by Mr. Wieland, tapir and rhino keeper at the zoo.

sides and stretching out their legs. This reaction was produced not only by scratching from other tapirs, but also by scratching from zookeepers, giant anteaters, and magpies.

Tapirs' activities during the daytime are influenced by maintenance conditions. Feeding - or at least the availability of natural food-items in outdoor enclosures - decreases resting time. Rain or artificial showers also increase activity, and sometimes leads to play that excites visitors.

The number of people watching the tapirs depends on two things: first, the type of enclosure, and second; the tapirs' activities. Best results are gained at exhibits without wire fences and with little shelter, so that animals are easily visible. When the animals are resting camouflaged, most visitors pass the exhibit without detecting them.

These results, which were obtained by data collection at the exhibits, directly contradict the results obtained by survey: survey respondents said that they prefer larger, naturally shaped exhibits with lots of vegetation (which can camouflage the tapirs).

The duration of a visit to the exhibit (how long a visitor watches the tapirs) seems to be independent of enclosure type and tapir species. Instead, it is dependent on the animal's behavior.

Signboards are noticed best where

they are (a) clearly visible and (b) combine colored pictures or symbols with short texts giving the most interesting facts.

Most respondents to the survey said that they recognized what a tapir was from former zoo visits; the second most common source of knowledge was television. Some children said that they had seen tapirs in picture books, and wanted to show their parents the animals in real life.

Although many zoo visitors are able to identify tapirs correctly, much confusion still exists. While all tapir species are most commonly mis-identified by zoo visitors as anteaters, mountain tapirs were more often compared or confused with bears. In contrast, the other three species were more often confused with pigs.

Conclusions

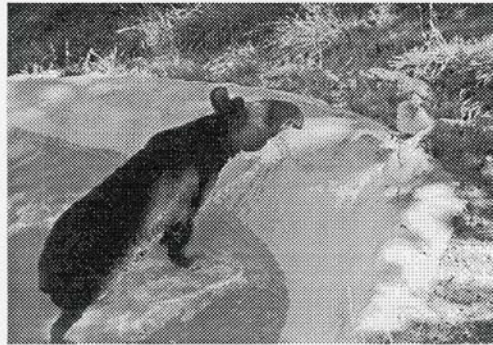
In every zoo where I conducted this study, I met a few visitors who said that tapirs were their favorite animals.

The positive reactions of zoo visitors increased with duration of time at the exhibit: whenever people had a reason to spend more time than average in watching tapirs, they began to like the tapirs a bit more. This fact indicates that zoos should keep the animals in exhibits where the animals can engage in all types of natural behavior. Furthermore, zoos should explain the most interesting facts about these animals on attractive and well-located signboards.

There seem to be only two ways to increase captive tapirs' activity and attractiveness to zoo visitors. One way is by enriching the tapirs' everyday lives by offering:

- a variety of food items at several times during the day
- showers
- pools (pools need not be large or elaborate - simply of adequate size for the tapir to immerse itself)

A second way could be attempting to mix tapirs with other species, e.g., smaller mammals or birds, in the kind of larger, naturally-structured exhibits that are very well accepted by zoo visitors. (In this case, some tricks may be necessary to make the animals



A male mountain tapir at the Cheyenne Mountain Zoo, Colorado Springs, Colorado, USA, demonstrates interest in two bar-headed geese that share his exhibit. Photo © 1996 by Marco Herranz.

remain visible to zoo visitors.)

Acknowledgements

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I would also like to offer many thanks to my supervisor, Professor Heinz F. Moeller, University of Heidelberg, Germany, who remembered the tapirs when I was searching for an interesting project; to the Association of Friends and Supporters of the Zoological Museum at Heidelberg University for sponsoring my trip to the USA; and last but not least, to Sheryl Todd of the Tapir Preservation Fund in Palisade, Colorado, USA, who keeps me up to date with information about tapirs, and discusses plans and results.

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Notable birth

The first Baird's tapir birth in Europe occurred on August 26, 1998, in Wuppertal, Germany. The baby, a female named Susanna, is doing very well. The dam is Tanya, born at the San Diego Zoo and exported to Wuppertal from Riverbanks Zoo, South Carolina, USA, in 1996. The sire is Tonka, born at the Columbus Zoo September 1993 and exported to Wuppertal in 1994. This was the first offspring for Tonka, the ninth for Tanya, who was 18 at the time of the birth. The Wuppertal Zoo also has a second male, Jasper, born at the Virginia Zoo, USA, in 1991.

Census

At the end of 1997, Rick Barongi reported that there were approximately 200 Malayan tapirs in zoos worldwide. Of these, 50 were in the U.S., 42 in Europe, 21 in Japan, and 87 in other Asian zoos.

In September, 1998, ISIS reported the tapirs in member facilities as: (males.females.unknown.births last 6 months)

<i>T. pinchaque</i>	3.2.0.0	2 zoos
<i>T. bairdii</i>	26.11.0.2	17 zoos
<i>T. indicus</i>	61.71.2.4	51 zoos
<i>T. terrestris</i>	94.87.1.15	74 zoos
<i>T. t. terrestris</i>	5.7.0.2	4 zoos

This data is listed on the web quarterly at: <http://www.worldzoo.org/>

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1997-1999 Triennium

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